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ABSTRACT

Each volume of this three-volume set is divided into two major sections. The first section presents the narrative report of a study designed to assist Michigan vocational agriculture teachers in implementing local competency-based vocational agriculture programs by (1) developing student performance objectives; (2) identifying up-to-date reference materials for teaching agricultural production, agricultural mechanics, and ornamental horticulture; and (3) developing a delivery system and materials to provide competency-based education training. The second section, which comprises the bulk of the document, contains three appendixes: student performance objectives, selected references for teachers, and a key to finding the sources. This third volume presents the identified objectives and reference materials for teaching ornamental horticulture. The other two volumes contain the objectives and reference materials for teaching agricultural production (CE 016 907) and agricultural mechanics (CE 016 908). (BM)

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ED159358

STUDENT PERFORMANCE OBJECTIVES AND SELECTED REFERENCES FOR TEACHING ORNAMENTAL HORTICULTURE

FINAL REPORT
VOLUME III OF III VOLUMES

VOCATIONAL-TECHNICAL EDUCATION SERVICE
MICHIGAN DEPARTMENT OF EDUCATION

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JUNE, 1976

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EDUCATION INSTITUTE

OE CIRC 9209

STUDENT PERFORMANCE OBJECTIVES AND SELECTED REFERENCES FOR TEACHING ORNAMENTAL HORTICULTURE

Volume III of III Volumes

Final Report

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June, 1976

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Finally, gratitude is expressed to the many public and private agencies whose cooperative support made this report possible.

Dr. Eddie A. Moore
Project Director

ABSTRACT

Title of Project: Development of a Delivery System and Materials to Provide Competency-Based Education Training for Michigan Vocational Agriculture Teachers

Project Staff: Eddie A. Moore, Assistant Professor and Project Director
Raymond J. Clark, Graduate Assistant
Richard M. Nysteun, Graduate Assistant
Raymond M. Clark, Project Consultant
Sandi L. Bauer, Project Secretary

Beginning and Ending Dates: January 1, 1976 through June 30, 1976

Purpose: To assist Michigan Vocational Agriculture Teachers (those employed and those in pre-service training) in acquiring the knowledge, information, and skills needed to implement local competency-based vocational agriculture programs.

Statement of Objectives: (1) To prepare a summary publication of a study conducted by Dr. William L. Thuemmel and other researchers which focused on the annual agricultural employment needs in Michigan for 1974 through 1979 and the characteristics of vocational agriculture programs in the state; (2) To develop student performance objectives and identify up-to-date reference materials for teaching Agricultural Production, Agricultural Mechanics, and Ornamental Horticulture; and (3) To develop a delivery system and materials to provide competency-based education training for Michigan teachers of vocational agriculture.

Description of Activities: A summary report of the study of Dr. Thuemmel and other researchers which focused on the agricultural employment needs for

a five-year period and the characteristics of Michigan vocational agriculture programs was prepared. Student performance objectives were developed and reference materials (eight-hundred or more publications were reviewed and evaluated) identified for three vocational agriculture instructional areas. A delivery system and materials were developed to provide competency-based education training for Michigan vocational agriculture teachers.

Contribution to Education: The summary publication is available for use by school administrators, Career Education Planning District coordinators, teachers of vocational agriculture, state department personnel, teacher edcuators and other individuals interested in long-range planning of vocational agriculture programs. Student performance objectives and selected references are available for improving the teacher/student learning process in three instructional program areas. Strategies for making Michigan vocational agriculture programs competency-based are available for implementation.

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THE NARRATIVE REPORT

Problem

In recent years, the Michigan Department of Education, Vocational-Technical Education Service has actively attempted to improve the quality of vocational education programs in Michigan. One approach used by the Vocational-Technical Education Service to improve the quality of vocational programs was the writing of student performance objectives. In the early 1970s, selected teachers representing service areas in the state were used in writing minimum state performance objectives. Many local vocational personnel adopted the state minimum performance objectives as a basis for operating accountable programs. Some local vocational educators elected to write their own student performance objectives. It has been stated by some local and state educators that the efforts spent in writing performance objectives in the early 1970s did in fact improve the quality of vocational education instruction in Michigan.

Because of rapid changes in agriculture and the need to prepare better graduates for filling various agricultural positions, the quality of vocational agriculture programs in Michigan were assessed during the 1974-75 academic year by Dr. William L. Thuemmel and other researchers. One objective of the study titled "Agribusiness and Natural Resources Education in Michigan: Manpower Needs, Competencies Needed, School Program Characteristics" was to "determine the competencies needed for entrance in agriculturally related jobs". A task analysis process was used to identify and validate competencies needed by beginning workers for entry into a cluster of agricultural occupations for

the following United States Office of Education (USOE) program areas: (1) Agricultural Production; (2) Agricultural Mechanics; and (3) Ornamental Horticulture. While examining some of the preliminary data reported by Dr. Thuemmel and others, it was deemed appropriate that a delivery system was needed to assist Michigan vocational agriculture teachers in the implementation of Competency-Based Instruction. During the latter months of 1975, representatives from the Michigan Department of Education, Vocational-Technical Service, faculty from the College of Agriculture and Natural Resources and the College of Education at Michigan State University held a series of meetings and agreed on a strategy for making vocational agriculture programs in Michigan Competency-Based. A proposal for carrying out this strategy was funded and the project begun in January, 1976.

Purpose and Objectives

The purpose of the project was to assist Michigan vocational agriculture teachers (those employed and those in pre-service training) in acquiring the knowledge, information, and skills needed to implement local competency-based vocational agriculture programs.

The primary objectives of the project were:

1. To prepare a summary report of a study conducted by Thuemmel and other researchers which focused on:
   a. Agricultural manpower needs (primarily for Michigan high school vocational agriculture graduates) for 1974 through 1979.
   b. Competencies needed by Michigan high school vocational agriculture graduates in order to enter various agricultural occupations.
   c. Congruencies and differences in existing vocational agriculture programs.

2. To develop student performance objectives based on the Thuemmel study and studies completed by other agencies, and identify up-to-date reference materials for teaching the following United States Office of Education vocational agriculture program areas:
   a. Agricultural Production
   b. Agricultural Mechanics
   c. Ornamental Horticulture
3. To develop a delivery system and materials to provide competency-based education training for Michigan vocational agriculture teachers.

Description of Activities

The project consisted of three activities: (1) Preparation of a summary report which focused on the manpower needs for Michigan high school vocational agriculture graduates and the quality of programs in the state; (2) Preparation of student performance objectives and the identification of reference materials for three vocational agriculture program areas; and (3) The development of a delivery system and materials to provide Competency-Based Education training for Michigan vocational agriculture teachers. Further discussion of each activity follows.

Summary Report.--A comprehensive research project titled "Agribusiness and Natural Resources in Michigan: Manpower Needs, Competencies Needed, and School Program Characteristics", was conducted by Thuemmel and other researchers during the 1974-75 academic year. Because of the terminology used in addition to being a lengthy final report (nearly 400 pages), a summary document which consist of approximately 40 pages has been prepared. In general, the summary report consist of the following: (1) Purpose and Objectives;

(2) Statements regarding the need for the study; (3) Methodology used; (4) Major findings; and (5) Recommendations. Persons interested in receiving a copy of the summary report should write to: Agriculture and Natural Resources Education Institute, 410 Agriculture Hall, Michigan State University, East Lansing, Michigan 48824.

Student Performance Objectives and Reference Materials.--In developing and compiling student performance objectives for the three instructional program areas (Objective 2), the project staff primarily used the task analysis results from the study conducted in 1974-75 by Dr. Thuemmel and other researchers at Michigan State University. Other sources used in developing student performance objectives for this project were as follows:

1. Amberson, Max L., Bishop, Douglas D., and Agocs, Barbara. Competency Commonalities and Accompanying Job Titles Derived from the Six Montana Agricultural Manpower Studies. Bozeman, Montana: Department of Agricultural and Industrial Education, Montana State University, 1975.

2. Bristol, Benton K. Volume III--Program Planning Guide in Agricultural Mechanics. Carbondale, Illinois: Southern Illinois University, 1975.

3. Moore, Eddie A., et al. A Study of Job Demands and Curriculum Development in Agricultural Training Related to the Muskegon County Wastewater Management System. Vol. III: Student Terminal Performance Objectives and Instructional Modules. Muskegon, Michigan: Vocational Education Department, Muskegon Area Intermediate School District, 1976. A research and program development project conducted pursuant to a contract from the U.S. Office of Education.

4. Rich, William and Wood, Eugene. Volume I--Program Planning Guide in Agricultural Production. Carbondale, Illinois: Southern Illinois University, 1975.

5. Ross, Roger T. and Stitt, Thomas R. Volume V--Program Planning Guide in Ornamental Horticulture. Carbondale, Illinois: Southern Illinois University, 1975.

6. U.S. Department of Health, Education and Welfare, Office of Education. Career Preparation in Agricultural Production--A Curriculum Guide for High School Vocational Agriculture. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1974.

7. U.S. Department of Health, Education and Welfare, Office of Education. Career Preparation in Agricultural Equipment and Mechanics--A Curriculum Guide for High School Vocational Agriculture, 1974.

8. U.S. Department of Health, Education and Welfare, Office of Education. Career Preparation in Ornamental Horticulture--A Curriculum Guide for High School Vocational Agriculture, 1974.

9. Warmbrod, J. Robert. Criterion-Referenced Instruments for Assessment of Specialized Vocational Agriculture Programs--Agribusiness Supplies and Services, Agricultural Mechanics, Horticulture, and Farm Management. Columbus, Ohio: Department of Agricultural Education, The Ohio State University, 1974.

The first step used in developing student performance objectives was the identification of module titles. Each module title consisted of one or more student performance objective. Student performance objectives written by the staff outlined specifically: (1) The conditions under which the student will perform; (2) What the student will be able to do after instruction; and (3) How well the student will perform. The student performance objectives were reviewed by teachers of vocational agriculture or other agricultural experts.

Approximately eight-hundred publications were reviewed and evaluated during the study. Selected references were identified for each module title to assist teachers in teaching the student performance objectives. Each reference was identified according to the type of material (i.e. bulletin, pamphlet, filmstrip, etc.) and an AGDEX number(s). AGDEX numbers were listed to assist teachers in filing reference materials when they arrived at the local school. In this publication you will find student performance objectives and references for Ornamental Horticulture. Persons interested in student performance objectives and reference materials for the instructional areas of Agricultural Production and Agricultural Mechanics should write to: Agriculture and Natural Resources Education Institute, 410 Agriculture Hall, Michigan State University, East Lansing, Michigan 48824.

A Delivery System and Materials to Provide Competency-Based Education Training for Michigan Vocational Agriculture Teachers.--Objective 3 of the project stated that the staff would develop a delivery system and materials to provide Competency-Based Education Training for Michigan Vocational Agriculture Teachers. To follow are materials which have been developed:

1. Competency-Based Education Information. A document titled "Utilizing Michigan's Vocational Education Competency-Based Education Approach in Conducting Effective Vocational Agriculture Programs" has been developed. This information has been written to assist Michigan vocational agriculture teachers (those employed and those in pre-service training) in acquiring the knowledge, information, and skills needed to implement local competency-based vocational agriculture programs.
2. Manual for Determining Agricultural Employment Needs in One or More Career Education Planning Districts (CEPDs). The need to determine local employment needs is probably more urgent today than ever before. A manual has been prepared to assist vocational agriculture teachers, administrators, advisory committee members, and other individuals in determining agricultural employment needs in one or more CEPDs.
3. An Instructional Strategy for Updating What is Being Taught and to Improve Instructional Process. With rapid technological changes in the agricultural industry, teachers of vocational agriculture must update the technical content and use a variety of teaching techniques that will enhance the learning of students. A delivery system for updating the technical content and for improving the instructional process has been refined and is available for use by teachers of vocational agriculture and other educators.

Individuals interested in more information briefly mentioned under project objective number 3 should write to: Eddie A. Moore, Agriculture and Natural Resources Education Institute, 410 Agriculture Hall, Michigan State University, East Lansing, Michigan 48824.

Recommendations

1. Future curriculum development activities should evolve around the core concept with the development of instructional modules based on written student performance objectives for three instructional program areas (i.e. Agricultural Production, Agricultural Mechanics, and Ornamental Horticulture). These modules should include as a minimum the following sections:
   a. Module Concept
   b. One or More Student Performance Objective
   c. Instructional Content Areas
   d. Supporting References
   e. Instructional Resources
   f. Student Learning Activities
   g. Objective Referenced Tests
2. A delivery system to provide Competency-Based Education Training for Michigan vocational agriculture teachers should be pilot tested and implemented starting September, 1976.

Directions for Using the Appendices

Shown in Appendix A are student performance objectives for five specialty areas within the Ornamental Horticulture area. These are consistent with and coded as defined in the Standard Terminology for Curriculum and Instruction in Local and State School Systems. The overall area of Ornamental Horticulture is given the designation 01.05 00. The specialty areas have the following designations:

Arboriculture	01.05 01
Floriculture (Including Greenhouse Operation and Management)	01.05 02
Landscape Establishment and Maintenance	01.05 04
Nursery Production	01.05 05
Turfgrass Establishment and Maintenance	01.05 06

Appendix B, you will note that references have been identified for module titles in each specialty area. Appendix C indicates where references might be ordered. The sample format and information on pages 8 to 12 explains how the Appendices should be used.

Explanation of the Format--As shown by Circle 1, the USOE vocational agriculture program area is Ornamental Horticulture. The specialty area shown in parenthesis is "Landscape Establishment and Maintenance". Circle 2 depicts the USOE code number for this specialty area. Shown with Circle 3 is the module title which should be covered by the instructor. As shown by Circle 4, student performance objectives for this module title were written in measurable terms. After reviewing the performance objectives, the teacher is given information relative to where references are listed in the document (see Circle 5). By going directly to the page specified, the teacher is able to see the type of up-to-date references which are available

(see Circle 6). In order to assist vocational agriculture teachers in the filing of agricultural publications a system (AGDEX) for classifying, indexing, and filing has been developed. Many vocational agriculture teachers in the state are presently using the AGDEX system for filing agricultural publications. New teachers are encouraged to use this unique filing system. Circle 7 shows that each reference has a set of one or more AGDEX numbers. In observing reference number "6" on page 11, you will note that there is a set of three numbers (275). This set of numbers represent a broad area (Ornamental and Shade Trees) in the AGDEX filing system. Reference number "1" illustrates two sets (275/22) of numbers. The first set of numbers (275) represent the broad area and the second set of numbers (22) represent a sub-topic area under the broad area. Reference number "3" has two sets of three digit numbers (641/550). In essence, if enough copies of this reference (reference number three) are available, the teacher could file this document under two broad areas.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

(1) Program Area: Ornamental Horticulture (Landscape Establishment and Maintenance) (2) USOE Code Number: 01.05 04

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
(3) PLANTING LANDSCAPE PLANTS AND TREES (5) References are on page 4.	(4) 1. Given a landscape plan, various types of plants which are bareroot, balled and burlapped, plus the necessary tools for transplanting,	the student will transplant various types of plants,	according to recommendations of the Cooperative Extension Service and/or teacher of vocational agriculture so that the plants are able to grow at their maximum.
	2. Given trees needing protection from winter winds and temperatures and provided with wrapping material, string, wire, and stakes,	the student will properly wrap and stake the trees,	so that the trees are anchored in an upright position and the soil remains firm to prevent drying of the roots.
	3. Provided with plants and trees, a choice of mulching material and sufficient hand tools,	the student will apply a mulch to the plants and trees,	so well that the weeds are controlled, the moisture maintained and the appearance enhanced.

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MODULE TITLE	REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
PLANTING LANDSCAPE PLANTS AND TREES	1. Koelling, Melvin R., Extension Bulletin E-771--Tree Planting in Michigan. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1973. (MI/3)	Bulletin	275/22
	2. Transplanting Shade Trees--VAS 5002. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2)	Pamphlet	275/22
	3. Mulches. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3)	Pamphlet	641/550
	4. Brooks, William M., Utzinger, J.D., and Tayama, Harry K., Extension Bulletin 526--Mulches for the Home Grounds. Columbus, Ohio: Cooperative Extension Service, The Ohio State University. (OH/3)	Bulletin	641/550
	5. Tree and Shrub Forms--Their Landscape Use. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3)	Pamphlet	272/17
	6. Baumgardt, John P., How to Care for Shade and Ornamental Trees. Kansas City, Missouri: Intertec Publishing Corporation, 1974. (MN/1)	Book	275
	7. USDA Home and Garden Bulletin 192--Transplanting Ornamental Trees and Shrubs. Washington, D.C.: Superintendent Of Documents for the U.S. Government Printing Office. (DC/1)	Bulletin	275/22
	8. Williams. L. and Herner, R.C., Using Mulches Around the Home (HM-9). East Lansing, Michigan: Horticulture Department, Michigan State University, 1974.	Bulletin	641/550
	9. Planting Ornamental Trees and Shrubs. Lafayette, Indiana: Audio-Visual Productions of Purdue University.	Slide Set	275/22

SAMPLE

KEY TO SOURCES

CODE	STATE	SOURCE AND ADDRESS
DC/1	District of Columbia	Superintendent of Documents U.S. Government Printing Office Washington, D.C. 20402
IL/2	Illinois	Vocational Agriculture Service 434 Mumford Hall University of Illinois Urbana, Illinois 61801
MI/1	Michigan	Agriculture and Natural Resources Education Institute 410 Agriculture Hall Michigan State University East Lansing, Michigan 48824
MI/3	Michigan	MSU Bulletin Office P.O. Box 231 East Lansing, Michigan 48824
MN/1	Minnesota	Hobar Publication 1305 Tiller Lane St. Paul, Minnesota 55112
NY/3	New York	Brookyln Botanic Garden 1000 Washington Avenue Brooklyn, New York 11225
OH/3	Ohio	Extension Bulletin Office The Ohio State University Columbus, Ohio 43210

APPENDIX A

Student Performance Objectives for Teaching Ornamental Horticulture

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (General Student Performance Objectives) USOE Code Number: 01.05 99

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
DEVELOPING EMPLOYABILITY SKILLS AND HUMAN RELATIONS	1. Provided a simulated position vacancy in an ornamental horticulture business or industry	the student will: a. write a personal resume b. write a letter of application c. complete an employment application d. present oneself in an interview	in such a manner that the student will be able to procure the desired position according to MSU Placement Manual and/or VAS unit #6001 Applying for a Job.
References are on page 68	2. Provided access to a common type of office found in an ornamental horticulture business or industry,	the student will: a. answer the telephone b. clearly converse on the telephone c. take telephone messages accurately d. place calls on the telephone e. prepare and mail a business letter f. file various forms and reports g. keep the office clean and organized	by following procedures of accepted general office practice as described in the Complete Secretary's Handbook or another appropriate reference.
	3. Provided placement in an ornamental horticulture business or industry	the student will exhibit proper relations with: a. fellow employees b. employer c. supervisors d. the public	as evaluated by the employer using criteria such as appearance, punctuality, dependability, interest, judgment, production, initiative and cooperation and/or in accordance with VAS unit #6003 Human Relations in Agricultural Business or any other appropriate reference.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (General Student Performance Objectives) USOE Code Number: 01.05 99

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
SELLING ORNAMENTAL HORTICULTURE PRODUCTS References are on page 68	1. Provided placement in an ornamental horticulture business or industry	the student will: a. meet the prospective customer b. conduct a sales presentation c. handle complaints and solve problems d. fill out appropriate sales forms	to the satisfaction of the customer and employer.
	2. Provided placement in an ornamental horticulture business or industry, a display window and the necessary promotion items	the student will arrange the display window	so as to promote and display items in a manner acceptable to the employer.
	3. Given the responsibility of advertising selected ornamental horticulture products and advertising materials,	the student will advertise the items (e.g. local newspaper, in the shop, etc.),	so as to promote the items in a manner acceptable to the employer and/or potential employer.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (General Student Performance Objectives) USOE Code Number: 01.05 99

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
USING HAND AND POWER TOOLS References are on page 69	1. Given various kinds of hand tools and power machinery used in the ornamental horticulture industry	the student will: a. correctly identify the tools and equipment b. describe their uses using proper nomenclature c. exhibit safe operating procedures for the various tools and machinery	at a 90% level of performance according to a tool and machinery catalog dealing with ornamental horticulture supplies and/or the instructor or some other designated person.
	2. Provided with equipment in need of repair and/or service and appropriate tools	the student will: a. select the proper tools b. repair and/or service equipment c. store the tools and equipment	according to repair or service manual or repair at a level of performance acceptable to the instructor or some other designated person.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (General Student Performance Objectives) USOE Code Number: 01.05 99

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
OPERATING AND MAINTAINING SMALL GASOLINE ENGINES References are on page 69	1. Given information regarding the safe operation of small gasoline engines and associated equipment	the student will: a. demonstrate and explain reasons why one should be both physically and mentally capable of operating small gasoline engines and associated equipment b. explain safety precautions necessary for the safe operation of small gasoline engines and associated equipment	so that the student will operate the engines and associated equipment in a safe and efficient manner to the satisfaction of the instructor or some other designated person.
	2. Given two basic types (2-stroke-cycle and 4-stroke-cycle) of small gasoline engines	the student will: a. explain the differences between the two types b. explain their basic principles of operation	according to AAVIM Small Engines Volume I pages 10-16 or another appropriate reference.
	3. Given access to a small gasoline engine and an operator's manual	the student will: a. start the engine b. adjust engine speed and load c. stop the engine	using procedures which promote optimum engine efficiency and operator safety according to AAVIM Small Engines Volume I pages 124-138 or another appropriate reference
	4. Given a 4-stroke-cycle engine and appropriate tools	the student will: a. select appropriate oil for the crankcase b. change the oil c. maintain proper crankcase oil level	according to manufacturer's specifications and/or AAVIM Small Engines Volume I pages 57-67.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (General Student Performance Objectives) USOE Code Number: 01.05 99

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
OPERATING AND MAINTAINING SMALL GASOLINE ENGINES	5. Given a small gasoline engine and appropriate tools	the student will: a. clean and service the carburetor air cleaner b. clean and service the fuel strainer c. clean and service the spark plug d. adjust the carburetor	for the most efficient performance according to manufacturer's specifications and/or AAVIM Small Engines Volume I and II.
	6. Given a small gasoline engine, tools and materials for cleaning an engine	the student will: a. clean the engine b. store the engine	so as to prevent corrosion and damage according to AAVIM Small Engines Volume I pages 140-144 or another appropriate reference.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (General Student Performance Objectives) USOE Code Number: 01.05 99

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
OPERATING AND MAINTAINING GASOLINE AND DIESEL POWER UNITS	1. Given information regarding the safe operation of gasoline and diesel power units and associated equipment	the student will demonstrate and explain reasons why one should be both physically and mentally capable of operating the units and associated equipment	so that the student will operate the units in a safe and efficient manner to the satisfaction of the instructor or some other designated person.
References are on page 70	2. Provided access to a gasoline power unit and a diesel power unit	the student will: a. differentiate between the two units b. explain their basic principles of operation	according to John Deere publication FOS Engines pages 1-17 or another appropriate reference.
	3. Provided access to both gasoline and diesel power units and the appropriate servicing items	the student will: a. identify parts requiring frequent greasing b. select grease and grease units c. maintain dry-type and oil bath air cleaners d. select appropriate oil for crankcase, transmission and hydraulic systems e. maintain oil levels and change oil when necessary in the crankcase, transmission and hydraulic systems f. maintain the cooling systems g. safely refuel the units	according to the operator's manuals and/or John Deere publication FMO Preventative Maintenance so that unnecessary repairs are prevented.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (General Student Performance Objectives) USOE Code Number: 01.05 99

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
OPERATING AND MAINTAINING GASOLINE AND DIESEL POWER UNITS	4. Provided access to both gasoline and diesel power units	the student will: a. start the unit b. operate the unit c. stop the unit	using procedures which promote optimum engine efficiency and operator safety as directed in the operator's manuals.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (General Student Performance Objectives) USOE Code Number: 01.05 99

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
CONTROLLING WEEDS References are on page 70	1. Given appropriate cultivating machinery, an area of land denoted to one or more ornamental horticultural industries, such as: arboriculture, floriculture, landscape establishment and maintenance, nursery production, or turf establishment and maintenance,	the student will: a. identify 20 of the most troublesome weeds, affecting plants in a given enterprise and local area b. prepare a plan for controlling the weeds by using the cultivation method c. select and adjust cultivation machinery d. operate cultivation machinery for controlling weeds e. clean and store machinery,	16 of the 20 most troublesome weeds for a given enterprise and common to the local area should be ide identified by their common names. The plan for controlling weeds and practices used should meet the approval of the Cooperative Extension Service, teachers of vocational agriculture, or some other individual designated by the instructor.
	2. Given appropriate chemical applicator, access to herbicides and an area of land denoted to one or more horticultural enterprises,	the student will: a. prepare a plan for controlling the weeds by applying herbicides b. select the most appropriate herbicide c. mix the chemical d. calibrate the applicator e. apply the herbicide f. clean and store the applicator g. store herbicide and dispose of empty containers,	according to manufacturer's direction as described on lbale and the Cooperative Extension Service in order to free plant species of troublesome weeds.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Arboriculture) **USOE Code Number:** 01.05 01

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
IDENTIFYING AND SELECTING TREES AND SHRUBS References are on page 71	1. Given access to the leaves of 20 trees common to the area,	the student will: a. express verbally or on paper the common names of the trees b. specify verbally or on paper whether the trees are broad leafs or conifers,	with an accuracy rate of at least 16 correct out of the 20 given trees according to MSU Bulletin E-616 Familiar Trees of Michigan or any other appropriate reference.
	2. Given access to various types of shrubs common to the area,	the student will identify the shrubs according to common names and explain their characteristics,	90% of the shrubs will be identified by common names and the explanation relative to shrub characteristics will meet the approval of the instructor.
	3. Given a set of landscaping plans or provided with a landscape site that requiees shrubs and trees,	the student will: a. specify verbally or paper the physical arrangement of the trees and shrubs b. specify verbally or on paper the specific type of shrub or tree needed in a particular location c. explain verbally or on paper a rationale for the location of the trees or shrubs,	with the selection evaluation based on the MSU Bulletin E-491 Landscape Planning for Rural Homes or any other appropriate reference and the rationale for placement must meet the approval of the instructor or some other designated person.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Arboriculture) USOE Code Number: 01.05 01

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PLANTING TREES AND SHRUBS References are on page 72	1. Given a landscape plan, various types of trees and shrubs which are bareroot, balled and burlapped, plus the necessary tools for transplanting,	the student will: a. dig a hole b. properly place the plant in the hole c. properly place soil around plant d. properly water the plant,	so well that the digging of the hole, placement of the plant, compaction of the soil, and the soil moisture is maintained according to MSU Bulletins E-771 Tree Planting in Michigan or E-914 Plant a Tree in 76.
	2. Provided access to trees needing protection from winter conditions (cold, wind, and temperatures) and given wrapping materials, string, wire, and stakes,	the student will properly wrap and stake the trees,	so well, that the tree is anchored in an upright position, the soil remains firm preventing drying of the roots, and the wrapping material remains in tact during the winter according to VAS Unit #5002 Transplanting Shade Trees or P.P. Pirone's book, Tree Maintenance.
	3. Provided with trees and shrubs, a choice of mulching material and sufficient hand tools,	the student will apply mulch to the trees and shrubs,	so well that the weeds are controlled, soil moisture is maintained, and the appearance enhanced, according to Brooklyn Botanic Garden pamphlet entitled Mulches and/or Ohio State Bulletin #526 Mulches for the Home Grounds or any other appropriate reference.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Arboriculture) USOE Code Number: 01.05 01

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
APPLYING FERTILIZER TO TREES References are on page 73	1. Provided access to a site with established trees and the appropriate soil testing equipment	the student will: a. collect a composite soil sample b. test the soil using a soil testing kit to determine the N, P, K levels and pH	according to the manual in a given soil testing kit and the fertilization requirements are those previously established by the instructor or some other designated person.
	2. Provided access to a site with established trees and the appropriate soil sampling equipment	the student will: a. collect a composite soil sample b. prepare and package sample c. send sample along with soil and cropping information to MSU or another approved soil laboratory d. interpret soil test results and verify fertilizer recommendations	according to the recommended procedures described in MSU Bulletins E-498 Sampling Soils and E-937 Understanding the MSU Soil Test Report.
	3. Given several fixed analysis fertilizers	the student will determine on paper or express verbally the pounds of actual plant food in each fertilizer	within a ± one pound according to MSU Bulletin E-786 Fertilizing Shade and Ornamental Trees or another appropriate reference.
	4. Provided access to 10 trees exhibiting undersized or yellow leaves, sparce foliage, or little twig or branch growth	the student will determine if the trees need nitrogen, phosphorus and/or potassium	with an accuracy rate of 8 out of 10 according to VAS Unit #5003 Fertilizing and Watering Shade and Ornamental Trees and/or MSU Bulletin E-786 Fertilizing Shade and Ornamental Trees.
	5. Given liquid and granular fertilizer applicators, access to a landscape site and some fertilizer	the student will: a. calibrate and apply the needed fertilizer to the trees b. prepare the equipment for storage following use	according to the recommendations of the manufacturer and/or MSU Bulletin E-786 Fertilizing Shade and Ornamental Trees.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Arboriculture) **USOE Code Number:** 01.05 01

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
TREE MAINTENANCE PROCEDURES References are on page 74	1. Given a tree damaged by insects and/or diseases and appropriate tree maintenance equipment,	the student will: a. diagnose the problem b. apply the recommended treatment c. administer the recommended control measures d. clean and store equipment,	in an attempt to preserve damaged tree and prevent further outbreaks of insects and disease according to Northeast Extension Publication No. 4 Tree Diseases-Description and Control and MSU Bulletin E-534 Controlling Pests of Trees and Shrubs or other references pertaining to insects and diseases of trees.
	2. Provided with a rope and a work order which requires rope to be used,	the student will: a. indicate verbally or on paper the appropriate knot or splice for the specific job description b. demonstrate the ability to tie the following knots and splices; bowline, bowline on a bite, clove hitch, square knot, sheet bend, timber hitch, half hitch, tautline, and block,	according to USDA Bulletin No. F-2130 Rope on the Farm and/or Hobar Publications super 8mm color film loop entitled Simple Knots and Hitches, or any other appropriate reference and to the approval of the instructor or some other designated person.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Arboriculture) USOE Code Number: 01.05 01

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
TREE MAINTENANCE PROCEDURES	3. Given a tree with a split fork or crotch, cables, and fasteners,	the student will: a. demonstrate the ability to climb the tree b. secure necessary cables and fasteners,	so well that the student reaches desired destination and the right number of fasteners and cables are placed at the correct height above the crotch to the satisfaction of the instructor or some other designated person.
	4. Given a tree in need of removal from site and the necessary tree removal equipment,	the student will demonstrate the ability to remove the limbs and/or cut the trunk and grind the refuse,	so well that the tree is felled in a predetermined direction, no property damage occurs, and all remains of the tree is removed.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Arboriculture) USOE Code Number: 01.05 01

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PRUNING TREES, SHRUBS, AND HEDGES References are on page 74	1. Given an injured tree or shrub and appropriate pruning tools,	the student will demonstrate the procedure for removing and/or repairing the injury,	so as to prevent the injured tree or shrub from becoming unsightly or dying according to USDA Home and Garden Bulletin No. 83 Pruning Shade Trees and Repairing Their Injuries or Roy L. Hudson's book The Pruning Handbook.
	2. Given a shrub in need of rejuvenation and appropriate pruning tools,	the student will: a. determine the amount of pruning needed b. determine time for pruning c. prune and treat the shrub,	so as to improve the health, productivity, and appearance of the shrub, according to USDA Home and Garden Bulletin No. 165 Pruning Ornamental Shrubs and Vines or Roy L. Hudson's book The Pruning Handbook.
	3. Given an odd shape shrub or hedge and appropriate pruning tools,	the student will correctively prune the shrub or hedge,	to develop a more balanced and compact appearance according to USDA Home and Garden Bulletin No. 165 Pruning Ornamental Shrubs and Vines or Roy L. Hudson's book The Pruning Handbook.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Floriculture) USOE Code Number: 01.05 02

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PREPARING PLANTING MEDIA References are on page 75	1. Provided with various media and media preparation equipment,	the student will prepare the following propagation media: a. rooting b. potting c. fine seeded,	according to MSU Bulletin E-516 Peats for Soil Improvement and Soil Mixes and VAS Unit #5006 Producing Plants by Asexual Propagation or any other appropriate reference.
	2. Given benches of media needing pasteurizing, chemical sterilants, and a source of steam,	the student will demonstrate the recommended procedure when pasteurizing a media bench using a chemical sterilant and steam system,	with such accuracy that undesirable organisms are destroyed. Chemicals must be applied according to specifications on container or package lable and steam must be applied to the soil for 30 minutes at 180°F.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Floriculture) USOE Code Number: 01.05 02

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PROPAGATING GREENHOUSE PLANTS References are on page 76	1. Given appropriate reference materials for seeding, various types of seeds, and the necessary growing media in greenhouse flats,	the student will: a. prepare the seedbed b. determine the method of seeding c. plant the seeds d. maintain environmental conditions for seedbeds after seeding,	so that 90% of the seeds sown will germinate, according to Penn State University Circular 533 Propagating House Plants and/or Hobar Publications, super 8mm color film loop entitled Seeding, or any other appropriate reference.
	2. Given various samples of seeds and necessary equipment for seed treatment,	the student will demonstrate proficiency in treatment of the seeds to improve germination by: a. stratification (moist storage) b. scarification (abrasion),	so well that an increase of 25% germination results by comparing a pretreated test plot with a post-treated test plot.
	3. Provided with 15 floral plants, the appropriate equipment for making cuttings, and the suitable growing media,	the student will: a. prepare the various types of rooting media b. demonstrate the proper procedure in making a cutting c. propagate the following: 3 leaf-bud cuttings 3 leaf cuttings 3 terminal bud cuttings 3 stem cuttings 3 root cuttings	so that 12 of the 15 cuttings will survive according to VAS Unit #5006 Producing Plants by Asexual Propagation and/or Hobar Publications, super 8mm color film loop entitled Softwood Cuttings, or any other appropriate rererences.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Floriculture) **USOE Code Number:** 01.05 02

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PROPAGATING GREENHOUSE PLANTS	4. Provided with various types of bulbs to be propagated and the necessary tools,	the student will: a. demonstrate the ability to separate the slabs or offsets b. replant the slabs or offsets,	so as to achieve a 3-fold multiplication of bulbs, according to USDA Bulletins G-136 Spring Flowering Bulbs and G-151 Summer Flowering Bulbs and/or VAS Unit #5006 Producing Plants by Asexual Propagation or any other appropriate reference.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Floriculture) **USOE Code Number:** 01.05 02

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
FERTILIZING FLORAL PLANTS References are on page 77	1. Given a media sample, a soil test recommendation for a specific floral plant, a concrete mixer, and a choice of soil conditioners and micro-nutrients,	the student will: a. express verbally if a soil conditioner and/or micro-nutrients are needed b. if so, blend a suitable conditioner and/or micro-nutrient mix with the soil media via the concrete mixer c. propagate the specified floral plants in the treated soil	so well that there is a visible increase in plant vigor between the treated soil and the non-treated soil and micronutrients are added according to MSU Bulletin E-486 Secondary and Micro-nutrients or another appro-priate reference.
	2. Given several fixed analysis fertilizers,	the student will determine on paper or express verbally the pounds of actual plant food in each fertilizer,	within a $\pm$ one pound.
	3. Given a liquid fertilizer applicator system, a bench of floral crops, and a soluble fertilizer,	the student will: a. dissolve soluble fertili-zer in water b. apply the fertilizer to a bench of floral plants c. clean and store applicator,	according to manufacturer's directions on the fertilizer's label and the recommendations of VAS Unit #5007 Growing Plants Indoors or another appropriate reference.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Floriculture) **USOE Code Number:** 01.05 02

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
MAINTAINING DESIRABLE ENVIRONMENTAL CONDITIONS IN THE GREENHOUSE References are on page 77	1. Given various kinds of floral crops to be grown in the greenhouse and the appropriate references,	the student will explain on paper or express verbally the optimum greenhouse environmental conditions needed for the specific crops,	by including in the explanation the following: shading, evaporation cooling, temperature, lighting, moisture, ventilation, and carbon dioxide content according to recommendations in University of Illinois Circular 879 Home Greenhouses, Agriculture Information Bulletin No. 357 Building Hobby Greenhouse, or Sunset Book, Garden Work Centers, or another appropriate reference.
	2. Given a specific floral crop to be grown, an equipped greenhouse and the recommended temperature and humidity for that crop,	the student will operate the heating, ventilating, and cooling systems,	according to the manufacturer's directions such that the temperature is regulated within a ± one degree Fahrenheit and the relative humidity is within a ±3% of the requirement.
	3. Given various kinds of floral crops and an equipped greenhouse,	the student will: a. operate and maintain automatic watering system b. hand water pot, bench and bedgrown crops,	so that the plants receive proper application (quantity and timing) of water and optimum drainage of the medium is provided according to the desire of the employer and/or teacher of vocational agriculture.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Floriculture) USOE Code Number: 01.05 02

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
CONTROLLING INSECTS AND DISEASES IN THE GREENHOUSE References are on page 78	1. Given 10 greenhouse plant specimens common to the area that are damaged by disease, insects, or other pests,	the student will recognize the source of damage on sight,	with an accuracy rate of at least 8 out of 10 according to Pascal P. Pirone's book Diseases and Pests of Ornamental Plants and/or USDA Bulletin G-67 Insects and Related Pests of House Plants or other appropriate references.
	2. Given specific information regarding pest problems and available control methods,	the student will carry out recommended procedures for controlling the problem(s) using chemical, biological and/or mechanical methods,	according to manufacturer's directions such that the pest problem(s) are alleviated according to Pascal P. Pirone's book, Diseases and Pests of Ornamental Plants and/or USDA Bulletin G-67 Insects and Related Pests of House Plants or other appropriate references.
	3. Given a variety of floral crops in a greenhouse,	the student will implement a prevention program for pest control,	that is recommended by Pascal P. Pirone's book, Diseases and Pests of Ornamental Plants or another appropriate references.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Floriculture) USOE Code Number: 01.05 02

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
IDENTIFYING FLOWERS, PLANTS, AND DECORATIVE MATERIALS References are on page 78	1. Given 10 various types of common cut flowers found in local floral businesses,	the student will: a. identify each by their common name b. specify verbally or in writing their common characteristics,	with an accuracy rate of at least 8 out of 10 according to MSU Bulletin E-410 Flower Arranging or another appropriate reference.
	2. Given 5 foliage and 5 flowering pot plants commonly found in local floral businesses,	the student will: a. identify each by their common name b. specify verbally or in writing their common uses,	with an accuracy rate of at least 8 out of 10 according to Cornell University Bulletin E-1117 Care of Flowering Plants in the Home and MSU Horticulture Department Bulletin HM-90 Care of Selected Foliage Plants or any other appropriate reference.
	3. Given 5 various kinds of foliages used for design work,	the student will: a. identify each by their common name b. specify verbally or in writing their common uses in design,	with an accuracy rate of at least 4 out of 5 according to MSU Bulletin E-410 Flower Arranging or another appropriate reference.
	4. Given 5 decorative materials such as containers, ribbons, netting, and holding devices,	the student will: a. recognize each b. explain verbally or in writing how each is used in floral design,	with an accuracy rate of at least 4 out of 5 according to VAS Unit #5009 Arranging Flowers in Vases and Bowls and/or MSU Bulletin E-410 Flower Arranging or any other appropriate reference.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Floriculture) USOE Code Number: 01.05 02

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PREPARING FLOWERS FOR SALE References are on page 79	1. Provided access to greenhouse grown flowers and potted flowering plants, sharp knife or pruning shears, containers, holders, florist clay, tape, and wire,	the student will: a. select and cut flowers from the greenhouse bench b. grade cut flowers c. condition cut flowers for wholesale handling d. pack cut flowers for sale and delivery e. prepare, gift wrap, and cold wrap potted flowering plants for delivery f. tag and display potted flowering plants,	according to trade standards as described in MSU Bulletin E-410 Flower Arranging or another appropriate reference.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Floriculture) USOE Code Number: 01.05 02

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
DESIGNING AND ARRANGING WITH FLOWERS AND DECORATIVE MATERIALS References are on page 79	1. Given a variety of cut flowers, decorative plant materials and accessories, and an order for an arrangement,	the student will: a. select the basic design shape b. select appropriate container c. arrange the flowers,	using the approved techniques described in MSU Bulletin E-410 Flower Arranging and/or Hobar Publications, super 8mm color film loop entitled Tools, Materials, and Accessories for Flower Arranging or any other appropriate reference.
	2. Given adequate plant materials, container, and accessories,	the student will construct each of the following arrangements: a. centerpiece b. hospital arrangement c. corsage d. basket e. wedding bouquet	using the approved techniques described in the Ohio Curriculum Materials, Retail Floriculture, Book II--Designing and Care of Flowers and Foliages or another appropriate reference.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Landscape Establishment and Maintenance) USOE Code Number: 01.05 04

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PREPARING THE LANDSCAPE SITE References are on page 81	1. Provided access to a specific landscape site to be landscaped and the necessary hand and power tools,	the student will use the tools to grade and drain the site,	according to the landscape plans by employing the techniques recommended in Intertec Publishing Corporations' book How to Have a Beautiful Lawn and/or University of Illinois Circular 858 Landscaping Your Home or any other appropriate reference.
	2. Provided access to a specific landscape site to be landscaped and the appropriate soil testing equipment,	the student will: a. collect a composite soil sample b. test the soil using a soil testing kit to determine the N,P,K, levels and pH,	according to the manual in a given soil testing kit and the fertilization requirements are those previously established by the instructor or some other designated person.
	3. Provided access to a specific landscape site to be landscaped and the appropriate soil sampling equipment,	the student will: a. collect a composite soil sample b. prepare and package sample c. send sample along with soil and cropping information to MSU or another approved soil laboratory, d. interpret soil test results and verify fertilizer recommendations,	according to the recommended procedures described in University of Wisconsin Circular #670 Sampling Lawn and Garden Soils and/or MSU Bulletins E-498 Sampling Soils and E-937 Understanding the MSU Soil Test Report.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Landscape Establishment and Maintenance) USOE Code Number: 01.05 04

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PREPARING THE LANDSCAPE SITE	4. Given a specific landscape plan, necessary tools and materials,	the student will construct walls, patios, walks, and/or other structures,	according to recommended procedures described in the University of Illinois Circular #858 Landscaping Your Home, Sunset Book Landscaping and/or MSU Bulletin E-691 Landscape Paving for Home Grounds or any other appropriate references

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Landscape Establishment and Maintenance) USOE Code Number: 01.05 04

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PLANTING LANDSCAPE PLANTS AND TREES References are on page 81	1. Given a landscape plan, various types of plants which are bareroot, balled and burlapped, plus the necessary tools for transplanting,	the student will transplant various types of plants,	according to recommendations of the Cooperative Extension Service and/or teacher of vocational agriculture so that the plants are able to grow at their maximum.
	2. Given trees needing protection from winter winds and temperatures and provided with wrapping material, string, wire, and stakes,	the student will properly wrap and stake the trees,	so that the trees are anchored in an upright position and the soil remains firm to prevent drying of the roots.
	3. Provided with plants and trees, a choice of mulching material and sufficient hand tools,	the student will apply a mulch to the plants and trees,	so well that the weeds are controlled, the moisture maintained and the appearance enhanced.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Landscape Establishment and Maintenance) USOE Code Number: 01.05 04

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
WATERING AND CONTROLLING WEEDS OF LANDSCAPE PLANTS AND TREES References are on page 82	1. Given access to various types of watering equipment and landscape plants,	the student will select the most appropriate equipment to use to supply the moisture needs of the area,	according to preferred growing conditions as suggested in MSU Bulletin E-426 Ornamental Evergreens for Michigan and MSU Bulletin E-552 Ornamental Deciduous Trees for Michigan and the choice of watering equipment must meet the approval of the instructor or some other designated person.
	2. Given a specific type of landscape planting and a source of water,	the student will: a. determine the amount and frequency of watering needed b. properly water the planting,	to provide the necessary moisture for productive growth to the approval of the instructor or some other designated person.
	3. Given a situation of weed infestation of a landscaped area and necessary control materials,	the student will: a. recognize the problem b. select the appropriate chemical, biological and/or mechanical procedures,	necessary for controlling the weeds according to MSU Horticulture Department Bulletin HM-74 Weed Control in Home Landscape and Flower Plantings and/or Monsanto Herbicide Handbook or any other appropriate reference.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Landscape Establishment and Maintenance) USOE Code Number: 01.05 04

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
WATERING AND CONTROLLING WEEDS OF LANDSCAPE PLANTS AND TREES	4. Given chemical weed control applicators and recommended granular, liquid, and wettable powder chemicals,	the student will properly: a. mix the chemical(s) b. calibrate applicator c. apply chemical(s) d. clean the equipment for storage,	according to directions on chemical container so well that the weeds are controlled according to the recommended practices described in Monsanto's Herbicide Handbook or another appropriate reference and to the satisfaction of the instructor or some other designated person.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Landscape Establishment and Maintenance) USOE Code Number: 01.05 04

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
CONTROLLING LANDSCAPE INSECTS AND DISEASES References are on page 83	1. Given 10 landscape plant specimens common to the area that are damaged by disease, insects or other pests,	the student will recognize the source of damage on sight,	with an accuracy rate of at least 8 out of 10 according to Pascal P. Pirone's book, Diseases and Pests of Ornamental Plants and/or Northeast Extention Publication 4 Tree Diseases and/or Clemson University Series CE10 Insects of Ornamental Plants and CE11 Shade and Forest Insects.
	2. Provided information regarding landscape pest problems and available control methods,	the student will carry out recommended procedures for controlling the problem(s) using chemical, biological and/or mechanical methods,	according to manufacturer's direction and/or MSU Bulletin E-534 Controlling Pests of Trees and Shrubs and/or Pascal P. Pirone's book, Diseases and Pests of Ornamental Plants such that the pest problem(s) are alleviated.
	3. Provided access to a landscaped area,	the student will implement a prevention program for pest control,	that is recommended in Pascal P. Pirone's book, Diseases and Pests of Ornamental Plants or another appropriate reference.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Landscape Establishment and Maintenance) USOE Code Number: 01.05 04

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PRUNING LANDSCAPE PLANTS AND TREES References are on page 84	1. Given an injured tree or shrub and appropriate pruning tools,	the student will demonstrate the procedure for removing and/or repairing the injury,	so as to prevent the injured tree or shrub from becoming unsightly or dying according to USDA Home and Garden Bulletin #83 Pruning Shade Trees and Repairing Their Injuries or Roy L. Hudson's book The Pruning Handbook.
	2. Given a shrub in need of rejuvenation and appropriate pruning tools,	the student will: a. determine the amount of pruning needed b. determine time for pruning c. prune and treat the shrub,	so as to improve the health, productivity, and appearance of the shrub, according to USDA Home and Garden Bulletin #165 Pruning Ornamental Shrubs and Vines or Roy L. Hudson's book The Pruning Handbook.
	3. Given an odd shape shrub or hedge and appropriate pruning tools,	the student will correctively prune the shrub or hedge,	to develop a more balanced and compact appearance according to USDA Home and Garden Bulletin #165 Pruning Ornamental Shrubs and Vines or Roy L. Hudson's book The Pruning Handbook.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Landscape Establishment and Maintenance) USOE Code Number: 01.05 04

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
FERTILIZING ESTABLISHED LANDSCAPE PLANTS AND TREES	1. Provided access to a site with established landscape trees and the appropriate soil testing equipment,	the student will: a. collect a composite soil sample b. test the soil using a soil testing kit to determine the N,P,K, levels and pH,	according to the manual in a given soil testing kit and the fertilization requirements are those previously established by the instructor or some other designated person.
References are on page 85	2. Provided access to a site with established landscape trees and the appropriate soil sampling equipment,	the student will: a. collect a composite soil sample b. prepare and package sample c. send sample along with soil and cropping information to MSU or another approved soil laboratory, d. interpret soil test results and verify fertilizer recommendations,	according to the recommended procedures described in MSU Bulletins E-498 Sampling Soils and E-937 Understanding the MSU Soil Test Report.
	3. Given several fixed analysis fertilizers	the student will determine on paper or express verbally the pounds of actual plant food in each fertilizer,	within a ± one pound according to MSU Bulletin E-786 Fertilizin Shade and Ornamental Trees or another appropriate reference.
	4. Provided access to 10 landscape plants or trees exhibiting undersized or yellow leaves, sparce foliage, or little twig, or branch growth,	the student will determine if the landscape plants or trees need nitrogen, phosphorus and/or potassium,	with an accuracy rate of 8 out of 10 according to VAS Unit #500 Fertilizing and Watering Shade and Ornamental Trees and/or MSU Bulletin E-786 Fertilizing Shade and Ornamental Trees.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Landscape Establishment and Maintenance) USOE Code Number: 01.05 04

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
FERTILIZING ESTABLISHED LANDSCAPE PLANTS AND TREES	5. Given liquid and granular fertilizer applicators, access to a landscape site and some fertilizer,	the student will: a. calibrate and apply the needed fertilizer to the trees and landscape plants b. prepare the equipment for storage following use,	according to the recommendations of the manufacturer and/or MSU Bulletin E-786 Fertilizing Shade and Ornamental Trees.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Nursery Production) USOE Code Number: 01.05 05

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
IDENTIFYING AND SELECTING NURSERY STOCK References are on page 86	1. Provided access to the leaves of 20 trees and shrubs common to the area	the student will: a. express verbally or on paper the common names of the trees b. specify verbally or on paper whether the trees are broad leafs or conifers	with an accuracy rate of at least 16 correct out of the 20 given trees according to MSU Bulletins E-616 Familiar Trees of Michigan and #E-493 Ornamental Shrubs for Michigan or any other appropriate reference.
	2. Given a set of landscaping plans or provided access to a landscape site that requires shrubs and trees	the student will: a. specify verbally or on paper the physical arrangement of the trees and shrubs b. specify verbally or on paper the specific type of shrub or tree needed in a particular location c. explain verbally or on paper a rationale for the location of the tree or shrub	with the selection evaluation based on the MSU Bulletin E-491 Landscape Planning for Rural Homes or Sunset book Landscaping or University of Illinois Circular 858 Landscaping Your Home and the rationale for placement must meet the approval of the instructor or some other designated person.

AGRICULTURE AND NATURAL RESOURCES EDUCATION INSTITUTE

VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Nursery Production) USOE Code Number: 01.05 05

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PREPARING PLANTING MEDIA	1. Provided with various types of media and the necessary media preparation equipment	the student will prepare the following propagation media: a. rooting b. potting c. fine seeded	according to MSU Bulletin E-516 Peats for Soil Improvement and Soil Mixes and VAS Unit #5006 Producing Plants by Asexual Propagation or any other appropriate reference.
References are on page 86	2. Given benches of media needing pasteurizing, chemical sterilants, and a source of steam	the student will demonstrate the recommended procedure when pasteurizing a media bench when using: a. a chemical sterilant b. steam	with such accuracy that undesirable organisms are destroyed. Chemicals must be applied according to specifications on container or package label and steam must be applied to the soil for 30 minutes at 180 degrees F.
	3. Provided access to young nursery stock, a choice of mulching material and sufficient hand tools	the student will apply a mulch to the young nursery stock	so well that the weeds are controlled, the moisture is maintained and the appearance is enhanced according to Brooklyn Botanic Garden pamphlet entitled Mulches and/or Ohio State Bulletin 526 Mulches for the Home Grounds or any othe appropriate reference.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Nursery Production) USOE Code Number: 01.05 05

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PRODUCING PLANTS BY SEXUAL PROPAGATION References are on page 87	1. Given appropriate reference materials for seeding, various types of seeds, and the necessary growing media	the student will: a. prepare the seedbed b. determine the method of seeding c. plant the seeds d. maintain the seedbeds in seedrows	so that 90% of the seeds sown will germinate, according to Intertec Publishing Corporation' book How to Have a Beautiful Lawn and/or Hobar Publications super 8mm color film loop entitled Seeding, or any other appropriate reference.
	2. Given various samples of seeds and necessary equipment for seed treatment	the student will demonstrate proficiency in treatment of the seeds to improve germination by: a. stratification (moist storage) b. scarification (abrasion)	so well that an increase of 25% germination results by comparing a pretreated test plot with a post-treated test plot.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Nursery Production) USOE Code Number: 01.05 05

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PLANTING AND TRANSPLANTING NURSERY STOCK References are on page 88	1. Provided access to 20 samples of nursery seedlings,	the student will identify the samples that are ready for transplanting,	with an accuracy rate of at least 16 correct out of the 20 samples provided according to USDA Home and Garden Bulletin 192 Transplanting Ornamental Trees and Shrubs and/or the Instructor or some other designated person.
	2. Provided access to a landscape site, a landscape plan, various types of plants which are bare-root, balled and burlapped, plus the necessary tools for transplanting,	the student will: a. dig the hole b. properly place the plant in the hole c. properly put soil around plant d. properly water the plant,	so well that the digging of the hole, placement of the plant, compaction of the soil, and the soil moisture is maintained according to MSU Bulletin E-914 Plant a Tree in 76, USDA Home and Garden Bulletin 192 Transplanting Ornamental Trees and Shrubs or any other appropriate reference.
	3. Provided access to trees needing protection from winter winds and temperatures and provided with wrapping material, string, wire, and stakes,	the student will properly wrap and stake the trees,	so that the tree is anchored in an upright position, the soil remains firm to prevent drying of the roots, and the wrapping material remains in tact during the winter according to VAS Unit #5002 Transplanting Shade Trees or any other appropriate reference.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Nursery Production) **USOE Code Number:** 01.05 05

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PLANTING AND TRANSPLANTING NURSERY STOCK	4. Provided access to trees and shrubs, a choice of mulching material and sufficient hand tools,	the student will apply a mulch to the trees and shrubs,	so well that the weeds are controlled, the moisture maintained and the appearance enhanced, according to Brooklyn Botanic Garden pamphlet entitled Mulches and/or Ohio State Bulletin 526 Mulches for the Home Grounds or any other appropriate reference.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Nursery Production) USOE Code Number: 01.05 05

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PROPAGATING BY CUTTINGS References are on page 88	1. Provided with 10 hardwood and 10 softwood stem parts, a knife and access to a mist system	the student will: a. prepare the specimens for mist bed propagation b. operate a mist system	so that 16 of the 20 specimens will survive according to Hobar Publications super 8mm color film loops entitled Softwood Cutting and Conifer and Hardwood Cutting and/or George Williams' book Nursery Crops and Landscape Designs or any other appropriate reference.
	2. Provided with 20 nursery plants, the appropriate equipment for making cuttings, and the suitable rooting media	the student will: a. prepare the various types of rooting media b. demonstrate the proper procedure in making a cutting c. propagate the following: 5 leaf-bud cuttings 5 leaf cuttings 5 terminal bud cuttings 5 root cuttings	so that 16 of the 20 cuttings will survive according to George Williams' book Nursery Crops and Landscape Designs and/or VAS Unit #5006 Producing Plants by Asexual Propagation or any other appropriate reference.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Nursery Production) USOE Code Number: 01.05 05

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
GRAFTING AND BUDDING References are on page 89	1. Provided with various types of nursery stock and the necessary tools and materials,	the student will: a. demonstrate the proper procedure in propagating plants from grafting b. propagate 5 cleft grafts c. propagate 5 bench grafts d. propagate 5 side grafts e. propagate 5 bark grafts	so that 16 of the 20 grafts will survive according to MSU Bulletin E-508 Budding and Grafting Fruit Trees and/or Habor Publications super 8mm color film loop entitled Cleft Graft or any other appropriate reference.
	2. Provided with 20 plants and the necessary tools and materials,	the student will: a. propagate by budding 10 plants testing the T-bud b. propagate 10 plants using the shield technique c. care for the plants after the budding procedure,	so that 16 of the 20 plants will survive according to MSU Bulletin E-508 Budding and Grafting Fruit Trees and/or George Williams book Nursery Crops and Landscape Designs or any other appropriate reference.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Nursery Production) USOE Code Number: 01.05 05

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
FERTILIZING NURSERY STOCK References are on page 89	1. Given a media sample, a soil test recommendation for a specific nursery plant, a concrete mixer, and a choice of soil conditioners and micronutrients,	the student will: a. express verbally if a soil conditioner and/or micronutrients are needed b. If so, blend a suitable conditioner and/or micronutrient mix with the soil media via the concrete mixer c. propagate the specified nusery plants in the treated soil,	so well that there is a visible increase in plant vigor between the treated soil and the non-treated soil and micronutrients are added according to MSU Bulletin E-486 Secondary and Micronutrients or another appropriate reference.
	2. Given several fixed analysis fertilizers,	the student will determine on paper or express verbally the pounds of actual plant food in each fertilizer,	within a $\pm$ one pound.
	3. Given a liquid fertilizer applicator system, a nursery crop, and a soluble fertilizer,	the student will: a. dissolve solvable fertilizer in water b. apply the fertilizer to the nursery crop c. clean and store applicator,	according to manufacturer's directions on the fertilizer's label and the recommendations of MSU Bulletin E-933 Liquid Fertilizers and VAS Unit #5007 Growing Plants Indoors or any other appropriate reference.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Nursery Production) USOE Code Number: 01.05 05

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PRUNING NURSERY STOCK References are on page 90	1. Given an injured tree or shrub and appropriate pruning tools,	the student will demonstrate the procedure for removing and/or repairing the injury,	so as to prevent the injured tree or shrub from becoming unsightly or dying according to USDA Home and Garden Bulletin #83 Pruning Shade Trees and Repairing Their Injuries or Roy L. Hudson's book The Pruning Handbook or any other appropriate reference.
	2. Given a shrub in need of rejuvenation and appropriate pruning tools,	the student will: a. determine the amount of pruning needed b. determine time for pruning c. prune and treat the shrub,	so as to improve the health, productivity, and appearance of the shrub, according to USDA Home and Garden Bulletin #165 Pruning Ornamental Shrubs and Vines or Roy L. Hudson's book The Pruning Handbook or any other appropriate reference.
	3. Given an odd shape shrub or hedge and appropriate pruning tools,	the student will correctively prune the shrub or hedge,	to develop a more balanced and compact appearance according to USDA Home and Garden Bulletin #165 Pruning Ornamental Shrubs and Vines or Roy L. Hudson's book The Pruning Handbook or any other appropriate reference

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Nursery Production) **USOE Code Number:** 01.05 05

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
CONTROLLING DISEASES, INSECTS, AND PESTS OF NURSERY STOCK References are on page 91	1. Provided access to five groups of nursery stock that have been damaged by disease, insects, or pests and given a choice of commonly used pesticides, mixing equipment and an appil	the student will: a. express verbally or on paper the type of pest(s) that the pesticide(s) are designed to control b. recognize the source of damage on sight or using a recognized reference c. recommend a control program for specific nursery pests d. follow legal restrictions as they pertain to handling and mixing the pesticides e. implement the control program by safely and legally applying pesticides,	according to the directions on the manufacturer's label and P.P. Pirone's book, Diseases and Pests of Ornamental Plants so that plant pest problems are controlled in four of the five groups of nursery stock.
	2. Given a surplus quantity of a pesticide mixture,	the student will safely dispose of and/or store the pesticide,	according to the directions on the manufacturer's label, governmental regulations, and the satisfaction of the instructor or some other designated person.
	3. Provided access to a nursery field plot or a group of container stock and given the necessary equipment and/or materials,	the student will implement a prevention program for pest control,	so well that no economic loss results from disease, insects, or pests according to P.O. Pirone's book Disease and Pests of Ornamental Plants or any other appropriate reference.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Nursery Production) USOE Code Number: 01.05 05

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PREPARING NURSERY STOCK FOR SALE References are on page 91	1. Provided access to nursery stock, power equipment, hand tools, burlap, containers, grading manual and tags,	the student will: a. dig bareroot ornamental stock b. ball and burlap ornamental stock c. dig and transplant stock to containers d. grade deciduous and conifer nursery materials e. tag and display nursery stock,	according to trade standards and to the satisfaction of the employer or some other designated person.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Turfgrass Establishment and Maintenance) USOE Code Number: 01.05 06

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
SELECTING TURFGRASSES FOR NEW PLANTINGS References are on page 92	1. Provided access to established turf areas which possess five different turfgrasses, areas which need to be seeded, information regarding intended use and environmental conditions,	the student will: a. identify the turfgrasses growing in the established area b. select appropriate varieties for the areas (such as golf courses, lawn, athletic field, etc.) to be seeded,	four of the five turf areas should be identified by their common names and the selection of varieties should be the same as those recommended by the Cooperative Extension Service and/or a private industry which specializes in this area.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Turfgrass Establishment and Maintenance) USOE Code Number: 01.05 06

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PREPARING THE TURFSITE References are on page 93	1. Provide access to a planned turf site,	the student will: a. identify the areas which need sub-surface drainage b. if necessary, recommend a drainage specialist who can provide tile drainage,	so that excess water in the soil is removed according to the 1957 yearbook of agriculture, Soil p. 378-385.
	2. Provided access to a rough graded turf site with adequate sub-surface drainage and using small engine powered or tractor-driven tillage equipment,	the student will: a. perform those operations necessary to provide for surface drainage b. prepare the seedbed soil surface c. service equipment d. clean and store equipment,	according to recommended procedures described in H.B. Sprague's book, Turf Management Handbook and James B. Beard's handbook Turfgrass: Science and Culture.
	3. Provided access to a graded and drained turf area and the appropriate soil testing equipment,	the student will: a. collect a composite soil sample b. test the soil using a soil testing kit to determine the N,P,K, levels and pH,	according to the recommended procedures described in MSU Bulletins E-498 Sampling Soils and E-937 Understanding the MSU Soil Test Report.
	4. Provided access to a graded and drained turf area and the appropriate soil sampling equipment,	the student will: a. collect a composite soil sample b. prepare and package sample c. send sample along with soil and cropping information to MSU or another approved soil laboratory d. interpret soil test results and verify fertilizer and lime recommendations,	according to the recommended procedures described in MSU Bulletins E-498 Sampling Soils and E-937 Understanding the MSU Soil Test Report.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Turfgrass Establishment and Maintenance) USOE Code Number: 01.05 06

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
PREPARING THE TURFSITE	5. Provided access to a graded and drained turf area and given the soil test results, the variety of turfgrasses to be established, the necessary applicator for spreading lime and fertilizer and an appropriate amount of fertilizer and lime,	the student will: a. calibrate applicator for applying lime and/or fertilizer b. apply lime and/or fertilizer c. service applicator d. clean and store equipment,	as recommended by soil test results and to assure meeting nutrient needs of the grasses to be planted according to James B. Beard's handbook Turfgrass: Science and Culture or H.B. Sprague's book Turf Management Handbook.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Turfgrass Establishment and Maintenance) USOE Code Number: 01.05 06

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
ESTABLISHING TURFGRASSES BY SEEDING AND VEGETATIVELY PLANTING References are on page 94	1. Provided access to a prepared turfsite, given the appropriate mulching materials, desired seed, and using small engine powered or tractor-driven tillage equipment,	the student will: a. determine the optimum time of seeding b. set the drill for proper seeding rate c. seed the turfgrass(es) d. apply a mulching material e. service equipment f. clean and store equipment,	for establishing a productive and manageable turf according to Ohio Agricultural Education Curriculum Materials Service, Turf Management and James B. Beard's handbook, How to Have a Beautiful Lawn.
	2. Provided access to an area to be sodded and provided soil, water source, irrigation facilities, pallet forklift, powered roller and tractor-driven equipment,	the student will: a. remove sod from an established sod producing area b. lay the sod in the prepared turfsite c. use a light roller after laying sod d. soak the sod within one hour after laying sod e. service equipment f. clean and store equipment,	so well that the sod is firmly knitted to the soil within 3 weeks after initiating according to James B. Beard's handbook Turfgrass: Science and Culture or any other appropriate reference.
	3. Provided access to a prepared turfsite and provided sprigs, water source, irrigation facilities, mechanical spreader, splicing planter and follow-up roller,	the student will: a. make a one to two inch furrow b. insert the sprigs 4 to 6 inches apart c. roll or tamp soil around the sprigs d. service equipment e. clean and store equipment,	such that the vegetative plant parts are distributed over the surface of the soil according to James B. Beard's handbook Turfgrass: Science and Culture or any other appropriate reference.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Turfgrass Establishment and Maintenance) USOE Code Number: 01.05 06

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
MOWING TURF AREAS References are on page 95	1. Provided access to a specific type of turf area and given the necessary mowing equipment,	the student will: a. select the equipment needed to mow the turf area b. adjust the equipment for cutting height c. mow the turf area d. service the equipment e. clean and store equipment,	according to its intended use as described in James B. Beard's handbook Turfgrass: Science and Culture or H.B. Sprague's book, Turf Management Handbook.
	2. Provided access to a specific type of turf area and given an appropriate mowing unit, power sweeper, fertilizer, applicator, and an irrigation system,	the student will: a. determine optimum time to mow the area b. adjust the mower c. operate the unit d. power sweep the organic material from the area e. haul organic material to disposal site f. irrigate immediately after mowing g. fertilize the area h. service equipment i. clean and store equipment,	such that the excessive accumlation of thatch is removed and the lawn quickly recovers according to James B. Beard's handbook Turfgrass: Science and Culture and/or Ohio Ag Ed Curriulum Materials Service, Turf Management.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Turfgrass Establishment and Maintenance) USOE Code Number: 01.05 06

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
MAINTAINING TURF FERTILITY References are on page 95	1. Provided access to an established turf area and given the appropriate soil sampling equipment,	the student will: a. collect a composite soil sample b. prepare and package sample c. send sample along with soil and cropping information to MSU or another approved soil laboratory d. interpret soil test results and verify fertilizer and lime recommendations,	according to the recommended procedures described in MSU Bulletins E-498 Sampling Soils and E-937 Understanding the MSU Soil Test Report.
	2. Provided access to an established turf area needing fertilizer and/or lime, a soil test report, fertilizer, lime and applicating equipment,	the student will: a. select the most efficient and economical fertilizer for the turf area b. calibrate fertilizer and lime applicator c. apply the fertilizer and lime d. service the applicator e. clean and store applicator,	according to the soil test report and as described by James B. Beard's handbook Turfgrass: Science and Culture or any other appropriate reference.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Turfgrass Establishment and Maintenance) USOE Code Number: 01.05 06

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
IRRIGATING TURF AREAS References are on page 96	1. Given various types of irrigating equipment, the turf varieties and the use of the turf area,	the student will: a. select the most appropriate equipment to use b. install the irrigation equipment,	in order to supply the mositure needs of the area according to James B. Beard's handbook Turfgrass: Science and Culture or any other appropriate reference.
	2. Provided access to a specific turf area with an irrigation system,	the student will: a. determine the amount of water needed b. determine the frequency of irrigation c. irrigate the area d. service the equipment for proper operation,	to improve shoot density, color, growth, and recuperation of the turfgrass area by following the prescribed methods in James B. Beard's handbook Turfgrass: Science and Culture or any other appropriate reference.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Turfgrass Establishment and Maintenance) USOE Code Number: 01.05 06

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
CONTROLLING TURFGRASS DISEASES, INSECTS, AND PESTS References are on page 97	1. Provided access to 5 different areas that have been damaged by disease, insects, or pests and given the choice of commonly used pesticides, mixing equipment, and an applicator,	the student will: a. express verbally or on paper the type of pest(s) that the pesticide(s) are designed to control b. recognize the source of damage on sight or using a recognize reference c. recommend a control program for specific nursery pests d. follow legal restrictions as they pertain to handling and mixing pesticides e. implement the control program by safely and legally applying pesticides f. safely dispose of and/or store the pesticide g. service pesticide applicator h. clean and store applicator,	according to the recommendation on the manufacturer's label and VAS Units #5015 Turfgrass Diseases and Their Control and #5016 Identifying and Controlling Lawn Insects so that turfgrass pest problems are controlled in four of the five areas.
	2. Provided access to a turf area and given the necessary equipment and/or material,	the student will implement a prevention program for pest control,	so well that no economic loss results from disease, insects, or pests according to James B. Beard's handbook Turfgrass: Science and Culture or any other appropriate reference.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Turfgrass Establishment and Maintenance) USOE Code Number: 01.05 06

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
RENOVATING OLD TURF AREAS References are on page 98	1. Provided access to five different turf areas in poor condition,	the student will: a. determine the cause(s) of low productivity b. select either renovation or reconstruction procedures to correct low productivity of turf area,	by accurately determining the cause of low productivity and selecting the best corrective procedure in 4 of the 5 turf areas as prescribed in James B. Beard's handbook Turfgrass: Science and Culture or any other appropriate reference.
	2. Provided access to a turf area needing renovation, the neccesary equipment and materials,	the student will: a. select best time to renovate b. remove undesirable species c. remove thatch and dead vegetation d. cultivate the ground e. correct soil reaction or salinity problems f. fertilize the area based on soil test results g. plant appropriate varieties h. roll the area i. service the equipment j. clean and store the equipment,	by following the prescribed procedures in James B. Beard's handbook Turfgrass: Science and Culture so that the turf area is rejunvenated to the satisfaction of the owner.
	3. Provided access to a turf area needing reestablishment, the necessary equipment and materials,	the student will: a. select the most appropriate time to reestablish the area b. kill any undesirable weedy grass species c. remove the existing turf d. prepare the soil e. replant the area f. irrigate the area g. service the equipment h. clean and store equipment,	by following the prescribed procedures in James B. Beard's book Turfgrass: Science and Culture so that the turf area is reestablished to the satisfaction of the owner.

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VOCATIONAL AGRICULTURE RESEARCH PROJECT PERFORMANCE OBJECTIVES

Program Area: Ornamental Horticulture (Turfgrass Establishment and Maintenance) USOE Code Number: 01.05 06

MODULE TITLE	CONDITIONS	PERFORMANCE	CRITERIA
GREENSKEEPING References are on page 99	1. Provided access to a golf green, fertilizer, lime, and an applicator,	the student will apply the fertilizer and/or lime to the golf green,	according to manufacturer's recommendations so as to provide the optimum amount of plant nutrients at the appropriate stage of the life cycle of the grass.
	2. Provided access to a golf green, a source of water and necessary irrigating equipment,	the student will manually and/or mechanically irrigate the golf green,	by using a fine mist-like spray until soil is well moistened to a depth of several inches, but not waterlogged.
	3. Provided access to a golf green and mowing equipment,	the student will adjust the mower and cut the turfgrass on the green,	so as to provide a turf surface conducive to accurate putting and the mowing meets the approval of a turf specialist or some other designated person.
	4. Provided access to a golf green, hand tools, and a golf cup,	the student will replace a cup on the putting green,	such that there is a one inch depth of rim of metal liner in the new hole, and the procedure meets the approval of the instructor or some other designated person.

APPENDIX B

Selected References for Teaching Ornamental Horticulture

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
DEVELOPING EMPLOYABILITY SKILLS AND HUMAN RELATIONS	1. Applying for a Job. VAS 6001. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	900/05
	2. Human Relations in Agricultural Business. VAS 6003. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	900/60
	3. MSU Placement Manual. East Lansing, Michigan: Placement Office, Michigan State University, 1975. (MI/2).	Bulletin	900/05
	4. Human Relations in Business. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1971. (OH/2).	Student Manual	900/60
	5. Human Relations in Agricultural Business. Urbana, Illinois: Vocational Agricultural Service. University of Illinois. (MI/1).	Filmstrip	900/60
SELLING ORNAMENTAL HORTICULTURAL PRODUCTS	1. Selling and Salesmanship--Student Manual. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1971. (OH/2).	Student Manual, teacher's guide is also available.	920/00
	2. Salesmanship. Ames, Iowa: Iowa Association for Vocational Instructional Materials, Iowa State University. (IA/1).	Transparency Masters	900/31
	3. Salesmanship in Agricultural Business. VAS 6001. Urbana, Illinois: Vocational Agriculture Service, University of Illinois, 1972. (IL/2).	Filmstrip	900/31
	4. Business Procedures and Records. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1971. (OH/2).	Manual	900/31
	5. The Use of the Cash Register. VAS 6005. Urbana, Illinois: Vocational Agriculture Service, University of Illinois, 1972. (IL/2).	Bulletin	900/30

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
USING HAND AND POWER TOOLS	1. Fundamentals of Service: Shop Tools. Moline, Illinois: John Deere and Company, 1971. (IL/1).	Manual	782
	2. Tool Identification Manual. San Luis Obispso, California: Vocational Education Productions, California State Polytechnic University, 1970. (CA/1).	Manual	782
OPERATING AND MAINTAINING SMALL GASOLINE ENGINES	1. Turner, J. Howard. Small Engines Vol. I--Care and Operation. Athens, Georgia: American Association for Vocational Instructional Materials, 1975. (MI/1).	Book	761
	2. Turner, J. Howard. Small Engines Vol. II--Maintenance and Repair. Athens, Georgia: American Association for Vocational Instructional Materials, 1971. (MI/1).	Book	761
	3. Small Engine Service Manual. St. Paul, Minnesota: Hobar Publications, 1973. (MN/1).	Book	761
	4. Carburetor Laboratory. St. Paul, Minnesota: Hobar Publications, 1973. (MN/1).	Slide Set	761
	5. Small Engine Disassembly and Assembly Laboratory. St. Paul, Minnesota: Hobar Publications, 1975. (MN/1).	Slide Set	761
	6. Magento Ignition Laboratory. St. Paul, Minnesota: Hobar Publications. (MN/1).	Slide Set	761
	7. Magneto Ignition Systems. St. Paul, Minnesota: Hobar Publications, 1973. (MN/1).	Slide Set	761
	8. Pipe, Ted. Small Gasoline Engines. Indianapolis, Indiana: Bobbs-Merrill Company, Inc., 1975. (IN/1).	Book	761
	9. Small Engines--Repair and Overhaul. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	761

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
OPERATING AND MAINTAINING GASOLINE AND DIESEL POWER UNITS	1. Rader, Thomas, ed. Fundamentals of Service: Engines. Moline, Illinois: John Deere and Company, 1972. (IL/1).	Book	761
	2. Hathaway, Louis. Fundamentals of Machine Operation: Preventive Maintenance. Moline, Illinois: John Deere and Company, 1973. (IL/1).	Book	787
	3. Tractor Maintenance Principles and Procedures. Athens, Georgia: American Association for Vocational Instructional Materials, 1970. (MI/1).	Book, slides are also available for this document.	787
	4. Groundskeeping Equipment Vol.1--Operating Tractors for Groundskeeping and Ornamental Horticulture. Athens, Georgia: American Association for Vocational Instructional Materials, 1974. (MI/1).	Book, slides are also available for this document.	787
	5. Use specific type of manual for type of machinery to be operated and/or maintained.		
CONTROLLING WEEDS	1. Steva, John L. and Ridenour, Harlan E. Weed Control--Cultural and Chemical. Columbus, Ohio: Ohio Agricultural Curriculum Materials Service, The Ohio State University, 1969. (OH/2).	Pamphlet	641
	2. Monsanto Herbicide Handbook. St. Louis, Missouri: Agriculture Division, Monsanto Company, 1974. (MO/1).	Book	641
	3. Rader, Thomas. Fundamentals of Service: Mowing and Spraying Equipment. Moline, Illinois: John Deere and Company, 1974. (IL/1).	Book	744
	4. Weed Control in the Home Garden. Brooklyn, New York: Brooklyn Botanic Garden, 1975. (NY/3).	Pamphlet	641/208
	5. USDA Bulletin HG123. Lawn Weed Control with Herbicides. Washington, D.C.: U.S. Department of Agriculture, 1971. (DC/1).	Bulletin	273/646

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
CONTROLLING WEEDS (cont.)	6. Williams, L.L. and Putnam, A.R. Horticulture Bulletin HM74. Weed Control in Home Landscape and Flower Plantings. East Lansing, Michigan: Horticulture Department, Michigan State University, 1975. (MI/1).	Bulletin	641
	7. Clark, Raymond and Churchill, Boyd. Weed Identification. East Lansing, Michigan: Agriculture and Natural Resources Education Institute, Michigan State University. (MI/1).	Slide set	641
	8. Lawn Weed Identification. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University. (OH/2).	Slide set and script	273/640
IDENTIFYING AND SELECTING TREES AND SHRUBS	1. Neal, James. Extension Bulletin E-616. Familiar Trees of Michigan. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/3).	Bulletin	270/30
	2. Cox, Joseph T. Extension Bulletin E-491. Landscape Planning for Rural Homes. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1964. (MI/3).	Bulletin	272/17
	3. Tree Identification (#636). Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Slide set	270/30
	4. 100 Finest Trees and Shrubs. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	270/30
	5. Trees for Landscaping. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1972. (OH/2).	Manual	275/17
	6. Trees for Effective Landscaping. East Lansing, Michigan: Horticulture Department, Michigan State University, 1975. (MI/1).	Slide Set	275/30

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
IDENTIFYING AND SELECTING TREES AND SHRUBS	7. USDA Bulletin G117. Trees for Shade and Beauty: Their Selection and Care. Washington, D.C.: U.S. Department of Agriculture, 1972. (DC/1).	Bulletin	270/30
	8. Shrubs for Landscaping. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1972. (OH/2).	Manual	276/17
PLANTING TREES AND SHRUBS	1. Koelling, Melvin R. Extension Bulletin E-771. Tree Planting in Michigan. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1973. (MI/3).	Bulletin	275/22
	2. Davidson, Harold. Extension Bulletin E-914. Plant a Tree in 76. East Lansing, Michigan: Cooparative Extension Service, Michigan State University, 1975. (MI/3).	Bulletin	275/22
	3. Transplanting Shade Trees. VAS 5002. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	275/22
	4. Pirone, Pascal P. Tree Maintenance. New York, New York: Oxford University Press, Inc., 1972. (NY/4).	Book	300/16
	5. Mulches. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	641/550
	6. Brooks, William M., Utzinger, J.D., and Tayama, Harry K. Extension Bulletin 526. Mulches for the Home Grounds. Columbus, Ohio: Extension Bulletin Office, The Ohio State University, 1975. (OH/3).	Bulletin	641/550
	7. Tree and Shrub Forms--Their Landscape Use. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	270/17
	8. Baumgardt, John P. How to Care for Shade and Ornamental Trees. Kansas City, Missouri: Intertec Publishing Corporation, 1974. (MO/1)	Book	275/10

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
PLANTING TREES AND SHRUBS (cont.)	9. USDA Home and Garden Bulletin 192. Transplanting Ornamental Trees and Shrubs. Washington, D.C.: U.S. Department of Agriculture, 1972. (DC/1).	Bulletin	275/22
	10. Williams, L. and Herner, R.C. Using Mulches Around the Home. (HM-9). East Lansing, Michigan: Department of Horticulture, Michigan State University, 1974. (MI/1).	Bulletin	641/550
	11. Planting Trees and Shrubs. Lafayette, Indiana: Audio-Visual Production, Purdue University. (MI/1).	Slide Set	275/22
APPLYING FERTILIZER TO TREES	1. Shickluna, John C. Extension Bulletin E-498. Sampling Soils. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/3).	Bulletin	533
	2. Warncke, D.D. and Robertson, L.S. Extension Bulletin E-937. Understanding the MSU Soil Test Report. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1976. (MI/3).	Bulletin	541
	3. Koelling, Melvin R. and Kielbaso, J. James. Extension Bulletin E-786. Fertilizing Shade and Ornamental Trees. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1974. (MI/3).	Bulletin	542
	4. Fertilizing and Watering Shade and Ornamental Trees. VAS 5003. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	542
	5. Fertilizing and Watering Shade and Ornamental Trees (#640). Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Filmstrip	542
	6. Baumgardt, John P. How To Care for Shade and Ornamental Trees. Kansas City, Missouri: Intertec Publishing Corporation, 1974. (MN/1).	Book	542

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
TREE MAINTENANCE PROCEDURES	1. Nichols, Lester P. Northeast Extension Publication No. 4. Tree Diseases, Description and Control. University Park, Pennsylvania: Cooperative Extension Service, Pennsylvania State University. (PA/1).	Bulletin	637
	2. Wallner, William E. Extension Bulletin E-534. Controlling Pests of Trees and Shrubs. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/3).	Bulletin	627
	3. USDA Bulletin F-2130. Rope on the Farm. Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office. (DC/1).	Bulletin	275/24
	4. Simple Knots and Hitches. St. Paul, Minnesota: Hobar Publications. (MN/1).	Filmloop	275/24
	5. Pirone, Pascal P. Tree Maintenance. New York, New York: Oxford University Press, Inc., 1972. (NY/4).	Book	275
	6. Baumgardt, John P. How to Care for Shade and Ornamental Trees. Kansas City, Missouri: Intertec Publishing Corporation, 1974. (MN/1).	Book	275
PRUNING TREES, SHRUBS, AND HEDGES	1. Home and Garden Bulletin 165. Pruning Ornamental Shrubs and Vines. Wahhington, D.C.: Superintendent of Documents, U.S. Government Printing Office, 1969. (DC/1).	Bulletin	270/24
	2. May, Curtis. Home and Garden Bulletin 83. Pruning Shade Trees and Repairing Their Injuries. Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office, 1969. (DC/1).	Bulletin	270/24
	3. Pruning Deciduous Snrubs (#644). Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Filmstrip or slide set	276/24
	4. Pruning Evergreens (#643). Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Filmstrip or slide set	276/24

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
PRUNING TREES, SHRUBS, AND HEDGES (cont.)	5. Pruning Flowering Trees (#645). Urbana, Illinois: Vocational Agriculture Service, University of Illinois: (IL/2).	Filmstrip or slide set	284/24
	6. Walterscheidt, Michael, Koelling, Melvin, and Heiligmann, Randall. Extension Bulletin E-962. Repairing Storm Damage to Shade and Ornamental Trees. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1976. (MI/3).	Bulletin	275
	7. Ornamental Horticulture--The Elements of Pruning. San Luis Obispo, California: Vocational Education Productions, California Polytechnic University. (CA/1).	Filmstrip	270/24
	8. Pruning. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	270/24
	9. Baumgardt, John P. How to Care for Shade and Ornamental Trees. Kansas City, Missouri: Intertec Publishing Corporation, 1974. (MN/1).	Book	275/24
	10. Pruning Ornamental Trees and Shrubs. Lafayette, Indiana: Audio-Visual Production, Purdue University. (MI/1).	Slide Set	275/24
PREPARING PLANTING MEDIA	1. Lucas, Robert E., Rieke, Paul E., and Farnham, Rouse S. Extension Bulletin E-516. Peats for Soil Improvement and Soil Mixes. East Lansing, Michigan: Cooperative Extension Service, Michigan State University. (MI/3).	Bulletin	530
	2. Producing Plants by Asexual Propagation. VAS 5006. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	280/28
	3. Soils. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	500
	4. The Greenhouse Worker. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1974. (OH/2).	Student	952

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
PROPAGATING GREENHOUSE PLANTS	1. Nuss, J. Robert. Circular 533. Propagating House Plants. University Park, Pennsylvania: Cooperative Extension Service, Pennsylvania State University. (PA/1).	Bulletin	285
	2. Seeding. St. Paul, Minnesota: Hobar Publications. (MN/1).	Filmloop	270/22
	3. Producing Plants by Asexual Propagation. VAS 5006. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	280/28
	4. Softwood Cuttings. St. Paul, Minnesota: Hobar Publications. (MN/1).	Filmloop	270
	5. Cathey, Henry M. USDA Bulletin G136. Spring Flowering Bulbs. Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office, 1971. (DC/1).	Fulletin	282
	6. Cathey, Henry M. USDA Bulletin G151. Summer Flowering Bulbs. Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office, 1971. (DC/1).	Bulletin	282
	7. Propagating Horticulture Plants. College Station, Texas: Vocational Instructional Service, Texas A&M University. (TX/1).	Transparencies	280/24
	8. Propagating Horticultural Plants. College Station, Texas: Vocational Instructional Service, Texas A&M University. (TX/1).	Pamphlet	280/24
	9. Propagation of Greenhouse Plants (#5316). College Station, Texas: Vocational Instructional Service, Texas A&M University, 1975. (TX/1).	Slide Set	280/24
	10. Propagation. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	200/24
	11. Williams, George S. Nursery Crops and Landscape Designs for Agribusiness Studies. Danville, Illinois: Interstate Printers and Publishers, Inc., 1975. (IL/7).	Book	272

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
PROPAGATING GREENHOUSE PLANTS (cont.)	12. Sikkes, A.J.A. and Carlson, W.H. Propagation of Indoor Plants. (HM-94). East Lansing, Michigan: Horticulture Department, Michigan State Univesrity. (MI/1).	Bulletin	285/24
	13. Asexual Propagation of Plants. East Lansing, Michigan: Michigan State University. (MI/1).	Slide Set	270/16
FERTILIZING FLORAL PLANTS	1. Vitosh, M.L., Warncke, D.D., and Lucas, R.E. Extension Bulletin E-486. Secondary and Micronutrients. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1973. (MI/3).	Bulletin	540
	2. Growing Plants Indoors. VAS 5007. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	
	3. Greenhouse Management (#5313). College Station, Texas: Vocational Instructional Service, Texas A&M University, 1975. (TX/1).	Slide Set	270/10
	4. Texas A&M University Staff. Watering and Feeding. College Station, Texas: Vocational Instructional Service, Texas A&M University, 1968. (OH/2).	Slide Set	200/15
	5. The Greenhouse Worker. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1974. (OH/2).	Student Manual	952
MAINTAINING DESIRABLE ENVIRONMENTAL CONDITIONS IN THE GREENHOUSE	1. Coutier, J.W. and Curtis, J.O. Circular 879. Home Greenhouses for Year-Round Gardening Pleasure. Urbana, Illinois: Cooperative Extension Service, University of Illinois, 1964. (IL/8).	Bulletin	731
	2. Bailey, William A., Liu, Robert C., and Klueter, Herschel H. Agriculture Information Bulletin 357. Building Hobby Greenhouses. Washington, D.C.L Superintendent of Documents, U.S. Government Printing Office, 1973. (DC/1).	Bulletin	731

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
MAINTAING DESIRABLE ENVIRONMENTAL CONDITIONS IN THE GREENHOUSE (cont.)	3. Sunset Book--Garden Work Center. Menlo Park, California: Lane Magazine and Book Company, 1970. (CA/2).	Book	731
	4. The Greenhouse Worker. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1974. (OH/2).	Student Manual	952
CONTROLLING INSECTS AND DISEASES IN THE GREENHOUSE	1. Pirone, Pascal P. Diseases and Pests of Ornamental Plants. New York, New York: The Ronald Press, 1970. (NY/5).	Book	270/600
	2. USDA Bulletin G-67. Insects and Related Pests of House Plants. Washington, D.C.: Superintendent of Document, U.S. Government Printing Office, 1972. (DC/1).	Bulletin	285/620
	3. Horst, R.K. and Schmohe, Daniel. Identification of Greenhouse Diseases and Their Control. Ithaca, New York: Instructional Materials Service, Cornell University, 1975. (NY/6).	Slide Set	630
	4. Bird, George W., et al. Extension Bulletin E-944. Pesticides for Ornamentals. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1976. (MI/3).	Bulletin	606
	5. Garden Pests. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	625
	6. The Greenhouse Worker. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1974. (OH/2).	Student Manual	952
IDENTIFYING FLOWERS, PLANTS, AND DECORATIVE MATERIALS	1. Carlson, William H. Horticulture Bulletin HM 90. Care of Selected Foliage Plants. East Lansing, Michgian: Agriculture and Natural Resources Education Institute, Michigan State University. (MI/1).	Bulletin	285

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
IDENTIFYING FLOWERS, PLANTS, AND DECORATIVE MATERIALS	2. Fischer, C.C. Extension Bulletin E-1117. Care of Flowering Plants in the Home. Ithaca, New York: Cooperative Extension Service, Cornell University, 1975. (NY/7).	Bulletin	285
	3. Ullenbrush, Mrs. William. Extension Bulletin E-410. Flower Arranging. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/3).	Bulletin	286
	4. Arranging Flowers in Vases and Bowls. VAS 5009. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	286
	5. Plant Identification: Annuals, Perennials, and House Plants San Luis Obispo, California: Vocational Education Productions of California Polytechnic State University. (CA/1).	Filmstrip	280/33
	6. The John Henry Retailer's Guide to Foliage Plants. Lansing, Michigan: The John Henry Company, 1976. (MI/7).	Pictorial Guide	285
	7. Manual for the John Henry Retailer's Guide to Foliage Plants Lansing, Michigan: The John Henry Company, 1976. (MI/7).	Manual	285
PREPARING FLOWERS FOR SALE	1. The Greenhouse Worker. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1974. (OH/2).	Student Manual	952
DESIGNING AND ARRANGING WITH FLOWERS AND DECORATIVE MATERIALS	1. Ullenbrush, Mrs. William. Extension Bulletin E-410. Flower Arranging. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/3).	Bulletin	286/80
	2. Tools, Materials, and Accessories for Flower Arranging. St. Paul, Minnesota: Hobar Publications. (MN/1).	Filmloop	286/80
	3. Retail Floriculture, Book II--Designing and Caring of Flowers and Foliage. Columbus, Ohio: Ohio Agricultural Curriculum Materials Service, The Ohio State University, 1976. (OH/2).	Book	285

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
DESIGNING AND ARRANGING WITH FLOWERS AND DECORATIVE MATERIALS (cont.)	4. Flower Arranging: Beginning Techniques. San Luis Obispo, California: Vocational Education Productions. (CA/1).	Filmstrip	286/80
	5. Gordon, Robert. Professional Flower Arranging for Beginners. San Luis Obispo, California: Vocational Education Productions. (CA/1).	Book	286/80
	6. Flower Arrangement. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	286/80
	7. Designing with Flowers and Decorative Materials. University Park, Pennsylvania: Pennsylvania State University. (OH/2).	Slide Set	286/80
	8. Natarella, M.A. and Carlson, W.H. Extension Bulletin E-558. Proper Care of Cut Flowers. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1967. (MI/3).	Bulletin	286/80
	9. Taylor, J. Lee. Assembling Dish Gardens and Terrariums. East Lansing, Michigan: ((MI/1).	Slide Set	286/80
	10. Taylor, J. Lee. Assembling Your Own Coursage. East Lansing East Lansing, Michigan: Michigan State University. (MI/1).	Slide Set	286/80
	11. Taylor, J. Lee. Flower Arrangement I. East Lansing, Michigan: Michigan State University. (MI/1).	Slide Set	286/80
	12. Taylor, J. Lee. Making Your First Flower Arrangements. East Lansing, Michigan: Michigan State University. (MI/1).	Slide Set	286/80
	13. Taylor, J. Lee. Flower Arrangement II. East Lansing, Michigan: Michigan State University. (MI/1).	Slide Set	286/80
	14. Flowers and You. Washington, D.C.: Teachers Library, Inc., (MI/1).	Slide Set	286/80
	15. Taylor, J. Lee. Winter Bouquet. East Lansing, Michigan: Michigan State University. (MI/1).	Slide Set	286/80

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
DESIGNING AND ARRANGING WITH FLOWERS AND DECORATIVE MATERIALS (cont.)	16. Taylor, J. Lee. Plaques From Dried Materials. East Lansing, Michigan: Michigan State University. (MI/1).	Slide Set	286/80
PREPARING THE LANDSCAPE SITE	1. Beard, James B. How to Have a Beautiful Lawn. Kansas City, Missouri: Intertec Publishing Corporation, 1975. (MN/1).	Book	272/17
	2. Handbook on Garden Construction. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Booklet	272/17
	3. Circular 670. Sampling Lawn and Garden Soils. Madison, Wisconsin: Cooperative Extension Service, University of Wisconsin. (WI/1).	Bulletin	533/273
	4. Shickluna, John C. Extension Bulletin E-498. Samping Soils East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/1).	Bulletin	533/273
	5. Warncke, D.D. and Robertson, L.S. Extension Bulletin E-937. Understanding the MSU Soil Test Report. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1976. (MI/1).	Bulletin	541
	6. Breen, Harold. Extension Bulletin E-691. Landscape Paving for Home Grounds. East Lansing, Michigan: Cooperative Extension Service, Michigan State University. (MI/1).	Bulletin	272/17
	7. Landscape Design. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1975. (OH/2).	Series of slides and script.	271
PLANTING LANDSCAPE PLANTS AND TREES	1. Koelling, Melvin R. Extension Bulletin E-771. Tree Planting In Michigan. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1973. (MI/3).	Bulletin	275/22

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
PLANTING LANDSCAPE PLANTS AND TREES (cont.)	2. Transplanting Shade Trees. VAS 5002. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Bulletin	275/22
	3. Mulches. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	275/22
	4. Brooks, William M., Utzinger. J.D., and Tayama, Harry K. Extension Bulletin 526. Mulches for the Home Grounds. Columbus, Ohio: Cooperative Extension Service, The Ohio State University. (OH/3).	Bulletin	641/550
	5. Tree and Shrub Forms--Their Landscape Use. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	272/17
	6. Baumgardt, John P. How to Care for Shade and Ornamental Trees. Kansas City, Missouri: Intertec Publishing Corporation, 1974. (MN/1).	Book	275
	7. USDA Home and Garden Bulletin 192. Transplanting Ornamental Trees and Shrubs. Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office. (DC/1).	Bulletin	275/22
	8. Williams, L. and Herner, R.C. Using Mulches Around the Home (HM-9). East Lansing, Michigan: Horticulture Department, Michigan State University, 1974. (MI/1).	Bulletin	641/550
	9. Planting Ornamental Trees and Shrubs. Lafayette, Indiana: Audio-Visual Productions, Purdue University. (MI/1).	Slide Set	275/22
WATERING AND CONTROLLING WEEDS OF LANDSCAPE PLANTS AND TREES	1. Monsanto Herbicide Handbook. St. Louis, Missouri: Agriculture Division, Monsanto Company, 1974. (MO/1).	Book	641
	2. Williams, L.L. and Putnam, A.R. Horticulture Bulletin HM 74. Weed Control in Home Landscape and Flower Plantings. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/3).	Bulletin	641

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
WATERING AND CONTROLLING WEEDS OF LANDSCAPE PLANTS AND TREES (cont.)	3. Cox, Joseph T. Extension Bulletin E-426. Ornamental Evergreens for Michigan. East Lansing, Michigan: Cooperative Extension Service, Michigan State University. (MI/3).	Bulletin	276
	4. Cox, Joseph T. Extension Bulletin E-552. Ornamental Deciduous Trees for Michigan. East Lansing, Michigan: Cooperative Extension Service, Michigan State Unviersity. (MI/3).	Bulletin	275
	5. Weed Control in the Home Garden. Brooklyn, New York: Brooklyn Botanic Garden, 1975. (NY/3).	Pamphlet	641
	6. Baumgardt, John P. How to Care for Shade and Ornamental Trees. Kansas City, Missouri: Intertec Publishing Corporation, 1974. (MN/1).	Book	275
CONTROLLING LANDSCAPE INSECTS AND DISEASES	1. Pirone, Pascal P. Diseases and Pests of Ornamental Plants. New York, New York: The Ronald Press Company, 1970. (NY/5)	Book	270/600
	2. Nichols, Lester P. Northeast Extension Publication No. 4. Tree Disease--Description and Control. University Park, Pennsylvania: Cooperative Extension Service, Pennsylvania State University. (PA/1).	Bulletin	275/637
	3. Wallner, William E. Extension Bulletin E-534. Controlling Pests of Trees and Shrubs. East Lansing, Michigan: Cooperative Extension Service, Michigan State University. (MI/3).	Bulletin	270/627
	4. Extension Bulletin CE 10. Insects of Ornamental Plants. Clemson, South Carolina: Cooperative Extension Service, Clemson University, 1968. (SC/1).	Bulletin	270/621
	5. Extension Bulletin CE 11. Shade and Forest Insects. Clemson, South Carolina: Cooperative Extension Service, Clemson University, 1968. (SC/1).	Bulletin	275/627

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
CONTROLLING LANDSCAPE INSECTS AND DISEASES (cont.)	6. Bird, George W., et al. Extension Bulletin E-944. Pesticides for Ornamentals. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1976. (MI/3).	Bulletin	270/606
	7. Garden Pests. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	208/620
	8. Shurtleff, Malcolm C. and Randell, Roscoe. How to Control Tree Diseases and Pests. Kansas City, Missouri: Intertec Publishing Corporation, 1975. (MN/1).	Book	275/600
PRUNING LANDSCAPE PLANTS AND TREES	1. Home and Garden Bulletin 165. Pruning Ornamental Shrubs and Vines. Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office, 1969. (DC/1).	Bulletin	276/24
	2. May, Curtis. Home and Garden Bulletin 83. Pruning Shade Trees and Repairing Their Injuries. Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office, 1969. (DC/1).	Bulletin	275/24
	3. Hudson, Roy L. The Pruning Handbook. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1972. (NJ/1).	Book	270/24
	4. Pruning Deciduous Shrubs (#644). Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Filmstrip or Slide Set	276/24
	5. Pruning Evergreens (#643). Urbana, Illinois: Vocational Agriculture Service, University of Illinois: (IL/2).	Filmstrip or Slide Set	276/24
	6. Pruning Flowering Trees (#645). Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Filmstrip or Slide Set	284/24
	7. Walterscheidt, Michael, Koelling, Melvin, and Heiligmann, Randall. Extension Bulletin E-962. Repairing Storm Damage to Shade and Ornamental Trees. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1969. (MI/3).	Bulletin	275/24

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
PRUNING LANDSCAPE PLANTS AND TREES (cont.)	8. Ornamental Horticulture--The Elements of Pruning. San Luis Obispo, California: Vocational Education Productions, California Polytechnic State University. (CA/1).	Filmstrip	270/24
	9. Pruning. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	270/24
	10. Baumgardt, John P. How to Care for Shade and Ornamental Trees. Kansas City, Missouri: Intertec Publishing Corporation, 1972. (MN/1).	Book	275
	11. Pruning Ornamental Trees and Shrubs. Lafayette, Indiana: Audio-Visual Productions of Purdue University. (MI/1).	Slide Set	270/24
FERTILIZING ESTABLISHED LANDSCAPE PLANTS AND TREES	1. Shickluna, John C. Extension Bulletin E-488. Sampling Soils. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/3).	Bulletin	533
	2. Warncke, D.D. and Robertson, L.S. Extension Bulletin E-937. Understanding the MSU Soil Test Report. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1976. (MI/3).	Bulletin	541
	3. Koelling, Melvin R. and Kielbaso, J. James. Extension Bulletin E-786. Fertilizing Shade and Ornamental Trees. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1974. (MI/3).	Bulletin	275/542
	4. Fertilizing and Watering Shade and Ornamental Trees. VAS 5003. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	275/542
	5. Fertilizing and Watering Shade and Ornamental Trees (#640). Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Filmstrip	275/542

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
FERTILIZING ESTABLISHED LANDSCAPE PLANTS AND TREES (cont.)	6. Baumgardt, John P. How to Care for Shade and Ornamental Trees. Kansas City, Missouri: Intertec Publishing Corporation, 1974. (MN/1).	Book	275
IDENTIFYING AND SELECTING NURSERY STOCK	1. Neal, James. Extension Bulletin E-616. Familiar Trees of Michigan. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/3).	Bulletin	300/33
	2. Cox, Joseph T. Extension Bulletin E-491. Landscape Planning for Rural Homes. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1964. (MI/3).	Bulletin	272/17
	3. Sunset Ideas for Landscaping. Menlo Park, California: Lane Magazine and Book Company. (CA/2).	Book	272/17
	4. Gerlach, Carl S. Extension Bulletin E-493. Ornamental Shrubs for Michigan. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1974. (MI/3).	Bulletin	276/33
	5. Nelson, William R. Circular 858. Landscaping Your Home. Urbana, Illinois: Cooperative Extension Service, University of Illinois, 1963. (IL/8).	Bulletin	272/17
	6. Tree Identification. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Slide Set	300/33
	7. Plant Identification. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Filmstrip	300/33
PREPARING PLANTING MEDIA	1. Lucas, Robert E., Rieke, Paul E., and Farnham, Rouse S. Extension Bulletin E-516. Peats for Soil Improvement and Soil Mixes. East Lansing, Michigan: Cooperative Extension Service, Michigan State University. (MI/3).	Bulletin	530

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
PREPARING PLANTING MEDIA (cont.)	2. Producing Plants by Asexual Propagation. VAS 5006. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	280/28
	3. Mulches. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	641/550
	4. Brooks, William M., Utzinger, J.D., and Tayama, Harry K. Extension Bulletin 526. Mulches for the Home Grounds. Columbus, Ohio: Cooperative Extension Service, Michigan State University. (OH/3).	Bulletin	641/550
	5. Ornamental and Nursery Plant Production. College Station, Texas: Vocational Instructional Service, Texas A&M University, 1975. (TX/1).	Transparencies	270/10
	6. Ornamental and Nursery Plant Production. College Station, Texas: Vocational Instructional Service, Texas A&M University, 1975. (TX/1).	Pamphlet	270/10
	7. Soils. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	500
	8. Williams, L. and Herner, R.C. Using Mulches Around the Home. (HM-9). East Lansing, Michigan: Horticulture Department, Michigan State University, 1974. (MI/1).	Bulletin	641/550
PRODUCING PLANTS BY SEXUAL PROPAGATION	1. Seeding. St. Paul, Minnesota: Hobar Publications. (MN/1).	Filmloop	200/22
	2. Beard, James B. How to Have a Beautiful Lawn. Kansas City, Missouri: Intertec Publishing Company, 1975. (MN/1).	Book	273
	3. Propagation. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	200/24

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
PLANTING AND TRANSPLANTING NURSERY STOCK	1. USDA Home and Garden Bulletin 192. Transplanting Ornamental Trees and Shrubs. Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office. (DC/1).	Bulletin	275/22
	2. Davidson, Harold. Extension Bulletin E-914. Plant a Tree in 76. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/3).	Bulletin	275/22
	3. Transplanting Shade Trees. VAS 5002. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	275/22
	4. Mulches. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	641/550
	5. Brooks, William M., Utzinger, J.D., and Tayama, Harry K. Extension Bulletin 526. Mulches for the Home Grounds. Columbus, Ohio: Cooperative Extension Service, The Ohio State University. (OH/3).	Bulletin	641/550
	6. Williams, L. and Herner, R.C. Using Mulches Around the Home. (HM-9). East Lansing, Michigan: Horticulture Department, Michigan State University, 1974. (MI/1).	Bulletin	641/550
	7. USDA Bulletin G192. Transplanting Ornamental Trees and Shrubs. Washington, D.C.: U.S. Department of Agriculture, 1972. (DC/1).	Bulletin	275/22
PROPAGATING PLANTS BY CUTTINGS	1. Softwood Cuttings. St. Paul, Minnesota: Hobar Publications. (MN/1).	Filmloop	275/24
	2. Conifer and Hardwood Cuttings. St. Paul, Minnesota: Hobar Publications. (MN/1).	Filmloop	275/24
	3. Williams, George S. Nursery Crops and Landscape Designs for Agribusiness. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1975. (IL/7).	Book	270/17

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
PROPAGATING PLANTS BY CUTTINGS (cont.)	4. Producing Plants by Asexual Propagation. VAS 5006. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	200/24
	5. Propagating Horticultural Plants. College Station, Texas: Vocational Instructional Service, Texas A&M University. (TX/1).	Transparencies	200/24
	6. Propagation of Greenhouse Plants (#5316). College Station, Texas: Vocational Instructional Service, Texas A&M University, 1975. (TX/1).	Slide Set	200/24
	7. Propagation Horticultural Plants (#107). College Station, Texas: Vocational Instructional Service, Texas A&M University. (TX/1).	Pamphlet	200/24
	8. Propagation. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	200/24
GRAFTING AND BUDDING	1. Williams, George S. Nursery Crops and Landscape Designs for Agribusiness. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1975. (IL/7).	Book	270/24
	2. Carlson, Robert F. and Mitchell, Arthur E. Extension Bulletin E-508. Budding and Grafting Fruit Trees. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1971. (MI/3).	Bulletin	210/24
	3. Cleft Graft. St. Paul, Minnesota: Hobar Publications. (MN/1).	Filmloop	275/24
	4. Budding and Grafting. San Luis Obispo, California: Vocational Education Productions, California Polytechnic State University. (CA 1).	Filmstrip	275/24
FERTILIZING NURSERY STOCK	1. Vitosh, M.L., Warncke, D.D., and Lucas, R.E. Extension Bulletin E-486. Secondary and Micronutrients. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1973. (MI/3).	Bulletin	531

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
FERTILIZING NURSERY STOCK (cont.)	2. Lucas, R.E. Extension Bulletin E-933. Liquid Fertilizers. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1976. (MI/3).	Bulletin	540
	3. Growing Plants Indoors. VAS 5007. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	540
PRUNING NURSERY STOCK	1. May, Curtis. Home and Garden Bulletin 83. Pruning Shade Trees and Repairing Their Injuries. Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office, 1969. (DC/1).	Bulletin	275/24
	2. Hudson, Roy L. The Pruning Handbook. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1972. (NJ/1).	Book	200/24
	3. Home and Garden Bulletin 165. Pruning Ornamental Shrubs and Vines. Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office, 1969. (DC/1).	Bulletin	276/24
	4. Pruning Deciduous Shrubs (#644). Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/1).	Filmstrip or Slide Set	276/24
	5. Pruning Evergreens (#643). Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/1).	Filmstrip or Slide Set	276/24
	6. Pruning Flowering Trees (#645). Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/1).	Filmstrip or Slide Set	284/24
	7. Walterscheidt, Michael, Koelling, Melvin, and Heiligmann, Randall. Extension Bulletin E-962. Repairing Storm Damage to Shade and Ornamental Trees. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1976. (MI/3).	Bulletin	275

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
PRUNING NURSERY STOCK (cont.)	8. Ornamental Horticulture--The Elements of Pruning. San Luis Obispo, California: Vocational Education Production, California Polytechnic State University. (CA/1)	Filmstrip	200/24
	9. Pruning. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	200/24
	10. Pruning Ornamental Trees and Shrubs. Lafayette, Indiana: Audio-Visual Production, Purdue University. (MI/1).	Slide Set	275/24
CONTROLLING DISEASES, INSECTS, AND PESTS OF NURSERY STOCK	1. Pirone, Pascal P. Diseases and Pests of Ornamental Plants. New York, New York: The Ronald Press Company, 1970. (NY/5).	Book	270/600
	2. Bird, George W., et al. Extension Bulletin E-944. Pesticides for Ornamentals. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1976. (MI/3).	Bulletin	270/606
	3. Garden Pests. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	620/208
	4. Shurtleff, Malcolm C. and Randell, Roscoe. How to Control Tree Diseases and Pests. Kansas City, Missouri: Intertec Publishign Corporation, 1975. (MN/1).	Book	275/600
	5. Wallner, W.E. Extension Bulletin E-534. Controlling Pests of Trees and Shrubs: Guide for Home Gardens. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/3).	Bulletin	275/627
PREPARING NURSERY STOCK FOR SALE	1. Koelling, Melvin R. Extension Bulletin E-771. Tree Planting in Michigan. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1973. (MI/3).	Bulletin	275/22

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
PREPARING NURSERY STOCK FOR SALE (cont.)	2. Transplanting Shade Trees. VAS 5002. Urbana, Illinois: Vocational Agriculture Service. (IL/2).	Pamphlet	275/22
	3. USDA Home and Garden Bulletin 192. Transplanting Ornamental Trees and Shrubs. Washington, D.C.: U.S. Department of Agriculture, 1972. (DC/1).	Bulletin	275/22
	4. Pirone, Pascal P. Tree Maintenance. New York, New York: Oxford University Press, Inc., 1972. (NY/4).	Book	300/16
SELECTING TURFGRASSES FOR NEW PLANTINGS	1. Evans, Rod. Establishing a Lawn. East Lansing, Michigan: Agriculture and Natural Resources Education Institute, Michigan State University, 1974. (MI/1).	Slide Set	273/31
	2. Sprage, Howard. Turf Management Handbook. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1976. (IL/7).	Book	273
	3. Beard, James B. Turfgrass: Science and Culture. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973. (NJ/1).	Book	273
	4. Beard, James B. How to Have a Beautiful Lawn. Kansas City, Missouri: Intertec Publishing Corporation, 1975. (MN/1).	Book	273
	5. Billick, John C. Turf Management. Columbus, Ohio: The Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1973. (OH/2).	Pamphlet	273
	6. Miller, Robert W. Lawn Care and Management. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1972. (OH/2).	Slide Set	273/10
	7. The Home Lawn Handbook. Brooklyn, New York: Brooklyn Botanic Garden. (NY/3).	Pamphlet	273/22
	8. Beard, J.B., et al. Extension Bulletin E-673. Lawn Establishment. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1973. (MI/3).	Bulletin	273/22

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MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
PREPARING THE TURF SITE	1. Evans, Rod. Establishing a Lawn. East Lansing, Michigan: Agriculture and Natural Resources Education Institute, Michigan State University, 1974. (MI/1).	Slide Set	273
	2. Sprage, Howard. Turf Management Handbook. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1976. (IL/7).	Book	273
	3. Beard, James B. Turfgrass: Science and Culture. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973. (NJ/1).	Book	273
	4. Shickluna, John C. Extension Bulletin E-498. Sampling Soils. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/3).	Bulletin	533
	5. Warncke, D.D. and Robertson, L.S. Extension Bulletin E-937. Understanding the MSU Soil Test Report. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1976. (MI/3).	Bulletin	541
	6. Schumacher, K.N. and Courson, R.L. Establishing a Lawn. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	273
	7. Beard, James B. How to Have a Beautiful Lawn. Kansas City, Missouri: Intertec Publishing Corporation, 1975. (MN/1).	Book	273
	8. Billick, John C. Turf Management. Columbus, Ohio: The Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1973. (OH/2).	Pamphlet	273
	9. Miller, Robert W. Lawn Care and Management. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1972. (OH/2).	Slide Set	273
	10. Beard J.B., et al. Extension Bulletin E-673. Lawn Establishment. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1973. (MI/3).	Bulletin	273/22

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
ESTABLISHING TURF-GRASSES BY SEEDING AND VEGETATIVELY PLANTING	1. Evans, Rod. Establishing a Lawn. East Lansing, Michigan: Agriculture and Natural Resources Education Institute, Michigan State University, 1974. (MI/1).	Slide Set	273/22
	2. Sprage, Howard. Turf Management Handbook. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1976. (IL/7).	Book	273
	3. Beard, James B. Turfgrass: Science and Culture. Englewood,Cliffs, New Jersey: Prentice-Hall, Inc., 1973. (NJ/1).	Book	273
	4. Billick, John C. Turf Management. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1973. (OH/2).	Pamphlet	273/22
	5. Beard, James B. How to Have a Beautiful Lawn. Kansas City, Missouri: Intertec Publishing Corporation, 1975. (MN/1).	Book	273
	6. Schumacher, K.N. and Courson, R.L. Establishing a Lawn. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	273/22
	7. Seeding. St. Paul, Minnesota: Hobar Publications. (MN/1).	Filmloop	273/22
	8. Billick, John C. Turf Management. Columbus, Ohio: Agricultural Education Curriculum Materials Service, The Ohio State University, 1975. (OH/2).	Pamphlet	273
	9. Williams, George S. Nursery Crops and Landscape Designs for Agribusiness Studies. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1975. (IL/7).	Book	270
	10. Beard, J.B., et al. Extension Bulletin E-673. Lawn Establishment. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1973. (MI/3).	Bulletin	273/22
	11. USDA Bulletin G-51. Better Lawns, Establishment, Maintenance, Renovation, Lawn Problems, Grasses. Washington, D.C.: U.S. Department of Agriculture, 1971. (DC/1).	Bulletin	273/22

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
MOWING TURF AREAS	1. Sprage, Howard. Turf Management Handbook. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1976. (IL/7).	Book	273
	2. Beard, James B. Turfgrass: Science and Culture. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973. (NJ/1).	Book	273
	3. Billick, John C. Turf Management. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1973. (OH/2).	Pamphlet	273/10
	4. Beard, James B. How to Have a Beautiful Lawn. Kansas City, Missouri: Intertec Publishing Corporation, 1975. (MN/1).	Book	273
	5. Beard, J.B., Rieke, P.E., and Anda, R.B. Extension Bulletin E-646. Lawn Care in Michigan. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/3).	Bulletin	273
MAINTAINING TURF FERTILITY	1. Sprage, Howard. Turf Management Handbook. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1976. (IL/7).	Book	273
	2. Beard, James B. Turfgrass: Science and Culture. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973. (NJ/1).	Book	273
	3. Shickluna, John C. Extension Bulletin E-498. Sampling Soils. East Lansing, Michigan: Cooperative Extension Service, Michigan State University. (MI/3).	Bulletin	533
	4. Warncke, D.D. and Robertson, L.S. Extension Bulletin E-937. Understanding The MSU Soil Test Report. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1976. (MI/3).	Bulletin	541

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
MAINTAINING TURF FERTILITY (cont.)	5. Beard, James B. How to Have a Beautiful Lawn. Kansas City, Missouri: Intertec Publishing Corporation, 1975. (MN/1).	Book	273
	6. Billick, John C. Turf Management. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1973. (OH/2).	Pamphlet	273
	7. Beard, J.B., et al. Extension Bulletin E-673. Lawn Establishment. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1973. (MI/3).	Bulletin	273/530
	8. Beard, J.B., Rieke, P.E., and Anda, R.B. Extension Bulletin E-646. Lawn Care in Michigan. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/3).	Bulletin	273
	9. USDA Bulletin G-89. Selecting Fertilizers for Lawns and Gardens. Washington, D.C.: U.S. Department of Agriculture, 1971. (DC/1).	Bulletin	273/530
IRRIGATING TURF AREAS	1. Sprage, Howard. Turf Management Handbook. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1976. (IL/7).	Book	273
	2. Beard, James B. Turfgrass: Science and Culture. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973. (NJ/1).	Book	273
	3. Beard, James B. How to Have a Beautiful Lawn. Kansas City, Missouri: Intertec Publishing Corporation, 1975. (MN/1).	Book	273
	4. Billick, John C. Turf Management. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1973. (OH/2).	Pamphlet	273

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
IRRIGATING TURF AREAS (cont.)	5. Miller, Robert W. Lawn Care and Management. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1972. (OH/2).	Slide Set	273
	6. Beard, J.B., Rieke, P.E., and Anda, R.B. Extension Bulletin E-646. Lawn Care in Michigan. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/1).	Bulletin	273
CONTROLLING TURF-GRASS DISEASES, INSECTS, AND PESTS	1. Bird, G.W. and Vargas, J.M. Extension Bulletin E-940. Diagnosis and Control of Nematode Problems of Turfgrass. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1976. (MI/3).	Bulletin	273/626
	2. Sprage, Howard. Turf Management Handbook. Danville, Illinois: The Interstate Printers and Publishers, Inc. (IL/7).	Book	273
	3. Beard, James B. Turfgrass: Science and Culture. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973. (NJ/1).	Book	273
	4. Courson, R.L. Identifying and Controlling Lawn Insects. VAS 5016. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	273/626
	5. Courson, R.L. Turfgrass Diseases and Their Control. Urbana, Illinois: Vocational Agriculture Service, University of Illinois. (IL/2).	Pamphlet	273/636
	6. Beard, James B. How to Have a Beautiful Lawn. Kansas City, Missouri: Intertec Publishing Corporation, 1975. (MN/1).	Book	273
	7. Billick, John C. Turf Management. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1973. (OH/2).	Pamphlet	273

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
CONTROLLING TURF-GRASS DISEASES, INSECTS, AND PESTS (cont.)	8. Shurtleff, Malcolm C. and Randell, Roscoe. How to Control Lawn Diseases and Pests. Kansas City, Missouri: Intertec Publishing Corporation, 1974. (MN/1).	Book	273/600
	9. Bird, George W., et al. Extension Bulletin E-944. Pesticides for Ornamentals. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1976. (MI/3).	Bulletin	273/606
	10. The Home Lawn Handbook. Brooklyn, New York: Brooklyn Botanic Gardens. (NY/3).	Pamphlet	273
	11. Juska, F.V. and Murray, J.J. USDA Bulletin HG61. Lawn Diseases: How to Control Them. Washington, D.C.: U.S. Department of Agriculture, 1973. (DC/1).	Bulletin	273/636
	12. Wallner, William E., et al. Extension Bulletin E-903. Lawn Pest Control. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/3).	Bulletin	273/626
RENOVATING OLD TURF AREAS	1. Sprage, Howard. Turf Management Handbook. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1976. (IL/7).	Book	273
	2. Beard, James B. Turfgrass: Science and Culture. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973. (NJ/1).	Book	273
	3. Beard, James B. How to Have a Beautiful Lawn. Kansas City, Missouri: Intertec Publishing Corporation, 1975. (MN/1).	Book	273
	4. Beard, J.B., Rieke, P.E., and Anda, R.B. Extension Bulletin E-646. Lawn Care in Michigan. East Lansing, Michigan: Cooperative Extension Service, Michigan State University, 1975. (MI/3).	Bulletin	273

MODULE TITLES	SELECTED REFERENCES	TYPE OF MATERIALS	AGDEX NUMBERS
RENOVATING OLD TURF AREAS (cont.)	5. USDA Bulletin G51. Better Lawns, Establishment, Maintenance, Renovation, Lawn Problems, Grasses. Washington, D.C.: U.S. Department of Agriculture, 1971. (DC/1).	Bulletin	273
GREENSKEEPING	1. Viergever, Richard. The Modern Golf Course Superintendent. Indianapolis, Indiana: Thompson Publishing Company, 1970. (IN/2).	Book	273
	2. Sprage, Howard. Turf Management Handbook. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1976. (IL/7).	Book	273
	3. Beard, James B. Turfgrass: Science and Culture. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973. (NJ/1).	Book	273
	4. Billick, John C. Turf Management. Columbus, Ohio: Ohio Agricultural Education Curriculum Materials Service, The Ohio State University, 1973. (OH/2).	Pamphlet	273/10
	5. Beard, James B. How to Have a Beautiful Lawn. Kansas City, Missouri: Intertec Publishing Corporation, 1975. (MN/1).	Book	273

APPENDIX C

Key to Sources

KEY TO SOURCES

CODE	STATE	SOURCE AND ADDRESS
AZ/1	Arizona	Department of Agriculture Education University of Arizona Tucson, Arizona 85721
CA/1	California	Vocational Education Productions California Polytechnic State University San Luis Obispo, California 93402
CA/2	California	Lane Magazine and Book Company Menlo Park, Californa 94025
CA/3	California	W.H. Freeman and Company 660 Market Street San Francisco, California 94104
CO/1	Colorado	Sheep Industry Development Program, Inc. 200 Clayton Street Denver, Colorado 80206
CO/2	Colorado	Agricultural Education Section Colorado State University 530 Peterson Street Ft. Collins, Colorado 80521
DC/1	District of Columbia	Superintendent of Documents U.S. Government Printing Office Washington, D.C. 20402
DC/2	District of Columbia	Animal Health Institute 1717 K Street, N.W. Suite 1009 Washington, D.C. 20006
IL/1	Illinois	John Deere Service Publications Department F John Deere Road Moline, Illinois 61265
IL/2	Illinois	Vocational Agriculture Service 434 Mumford Hall University of Illinois Urbana, Illinois

CODE	STATE	SOURCE AND ADDRESS
IL/3	Illinois	Goodheart-Willcox Company 123 W. Taft Drive South Holland, Illinois 60473
IL/4	Illinois	American Technical Society 5608 Stoney Island Avenue Chicago, Illinois 60637
IL/5	Illinois	Chas. A. Bennett Company 809 W. Detweiller Drive Peoria, Illinois 61614
IL/6	Illinois	Farm Department National Safety Council 425 North Michigan Chicago, Illinois 60611
IL/7	Illinois	Interstate Printers and Publishers, Inc. Danville, Illinois 61832
IL/8	Illinois	Extension Bulletin Office Cooperative Extension Service University of Illinois at Urbana-Champaign Urbana, Illinois 61801
IL/9	Illinois	A&L Publications Station A, Box F Champaign, Illinois 61820
IL/10	Illinois	Stipes Publishing Company Champaign, Illinois 61820
IL/11	Illinois	National Livestock and Meat Board 36 S. Wabash Avenue Chicago, Illinois 60603
IN/1	Indiana	The Bobbs-Merrill Company, Inc. Educational Publishign Division Continuing Education & College Department 4300 W. 62nd Street Indianapolis, Indiana 46268
IN/2	Indiana	The Thompson Publishing Company Box 50160 Indianapolis, Indiana 46250

CODE	STATE	SOURCE AND ADDRESS
IA/1	Iowa	IAVIM Center ATTN: Thomas A Hoerner Agriculture Engineering Department Iowa State University Ames, Iowa 50010
IA/2	Iowa	Extension Bulletin Office Cooperative Extension Service Iowa State University Ames, Iowa 50010
IA/3	Iowa	Iowa State University Press South State Avenue Ames, Iowa 50010
IA/4	Iowa	Kendall/Hunt Publishing Company 2460 Kerper Blvd. Dubuque, Iowa 52001
KY/1	Kentucky	The Public Relations and Information Department Farm Credit Banks of Louisville P.O. Box 239 Louisville, Kentucky 40201
MA/1	Maryland	Sprinkler Irrigation Association 13975 Conneticut Avenue Silver Springs, Maryland 20906
MA/2	Maryland	The Williams and Wilkins Company 428 E. Preston Street Baltimore, Maryland 21202
MI/1	Michigan	Agriculture and Natural Resources Education Institute 410 Agriculture Hall Michigan State University East Lansing, Michigan 48824
MI/2	Michigan	Michigan State University Placement Services Room 146 Student Services Building Michigan State University East Lansing, Michigan 48824
MI/3	Michigan	Extension Bulletin Office Cooperative Extension Service Michigan State University East Lansing, Michigan 48824

CODE	STATE	SOURCE AND ADDRESS
MI/4	Michigan	General Motors Corporation Public Relations Department Detroit, Michigan 48202
MI/5	Michigan	4-H Bulletin Office 175 South Anthony Hall Michigan State University East Lansing, Michigan 48824
MI/6	Michigan	Training Branch U.S. Treasury Department P.O. Box 84 Detroit, Michigan 48231
MI/7	Michigan	Beverly Tallman The John Henry Company P.O. Box 1410 Lansing, Michigan 48904
MI/8	Michigan	Michigan Association of Farmer Cooperatives P.O. Box 30960 Lansing, Michigan 48909
MN/1	Minnesota	Hobar Publications 1305 Tiller Lane St. Paul, Minnesota 55112
MN/2	Minnesota	Extension Bulletin Office Cooperative Extension Service University of Minnesota St. Paul, Minnesota 35108
MO/1	Missouri	Monsanto Company 800 N. Lindberg St. Louis, Missouri 63166
MO/2	Missouri	Mr. Amon Herd, Director Instructional Materials Laboratory 10 Industrial Education Building University of Missouri--Columbia Columbia, Missouri 65201
MO/3	Missouri	Doane Agricultural Service, Inc. 8900 Manchester St. Louis, Missouri 63144
NJ/1	New Jersey	Prentice-Hall, Inc. Englewood Cliffs, New Jersey 07632

CODE	STATE	SOURCE AND ADDRESS
NY/1	New York	Union Carbide Corporation Linde Division 270 Park Avenue New York, New York 10017
NY/2	New York	McGraw-Hill Book Company, Inc. 330 West 42nd Street New York, New York 10039
NY/3	New York	Brooklyn Botanic Garden 1000 Washington Avenue Brooklyn, New York 11225
NY/4	New York	Oxford University Press 200 Madison Avenue New York, New York 10016
NY/5	New York	Ronald Press 79 Madison Avenue New York, New York 10016
NY/6	New York	Cornell University Instructional Materials Service Ithaca, New York 14850
NY/7	New York	Extension Bulletin Office Cooperative Extension Service Cornell University Ithaca, New York 14850
NY/8	New York	The Macmillan Company 866 Third Avenue New York, New York 10022
NY/9	New York	Bruce Publishing Company 400 North Broadway Milwaukee, Wisconsin 53202
NY/10	New York	Agricultural Marketing Group Edison Electric Institute 90 Park Avenue New York, New York 10016
NY/11	New York	Institute of Life Insurance 277 Park Avenue New York, New York 10017

CODE	STATE	SOURCE AND ADDRESS
NY/12	New York	Springer Publishing Company, Inc. 200 Park Avenue, South New York, New York 10003
NY/13	New York	John Wiley & Sons, Inc. 440 Park Avenue, South New York, New York 10016
OH/1	Ohio	James F. Lincoln Arc Welding Foundation P.O. Box 3035 Cleveland, Ohio 44117
OH/2	Ohio	Ohio Agricultural Education Curriculum Materials Service The Ohio State University Room 254, 2120 Fyffe Road Columbus, Ohio 43210
OH/3	Ohio	Extension Bulletin Office Cooperative Extension Service The Ohio State University Columbus, Ohio 43210
PA/1	Pennsylvania	Extension Bulletin Office Cooperative Extension Service Pennsylvania State University University Park, Pennsylvania 16802
PA/2	Pennsylvania	Sperry New Holland New Holland, Pennsylvania 17557
PA/3	Pennsylvania	Lea & Febiger 600 South Washington Square Philadelphia, Pennsylvania 19106
SC/1	South Carolina	Extension Bulletin Office Cooperative Extension Service Clemson University Clemson, South Carolina 29631
TX/1	Texas	Vocational Instructional Service F.E. Box 182 Texas A&M University College Station, Texas 77843
VA/1	Virginia	National Concrete Masonry Association 1800 N. Kent Arlington, Virginia 22209

CODE		
VA/2	Virginia	Extension Bulletin Office Cooperative Extension Service Virginia Polytechnic Institute and State University Blacksburg, Virginia 24061
WI/1	Wisconsin	Extension Bulletin Office Cooperative Extension Service University of Wisconsin Madison, Wisconsin 53706
WI/2	Wisconsin	National Vo-Ag Book Company Sheldon, Wisconsin 54766
WI/3	Wisconsin	The Highsmith Company, Inc. P.O. Box 150 Fort Atkinson, Wisconsin 53538
WI/4	Wisconsin	Midwest Breeders Cooperative Shawano, Wisconsin 54166